THE POLAR TIMES

U.S.S. Burton Island establishes ice station Arlis I, September 1960. (Official U.S. Navy photo)

FIG. 4. Camp Putu, ARL field station on the Colville River Delta.

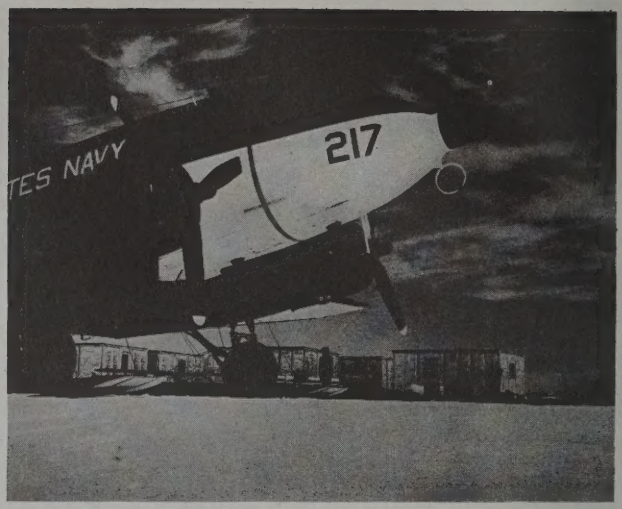


FIG. 5. ARL C47 (USN R4D) aircraft during establishment or research station on Ice Island ARLIS-II, 28 May 1961. ARL photograph.

FIG. 6. ARLIS-II research station. ARL photograph.

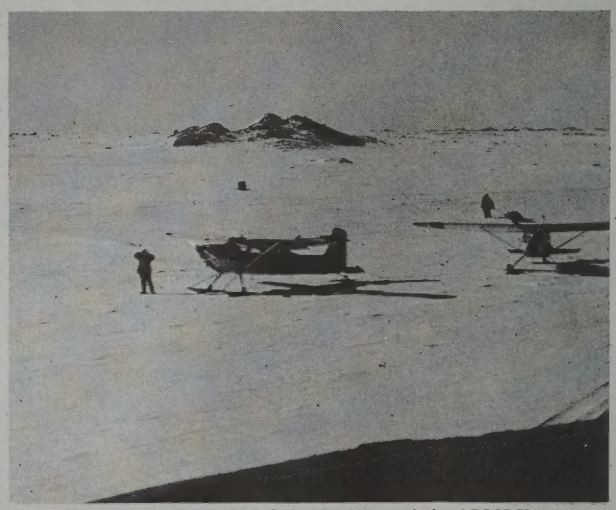


FIG. 7. ARL Cessna 180 aircraft support research in ARLIS-II, 23 May 1961. Note ice hills mantled by glacial debric. ARL photograph.

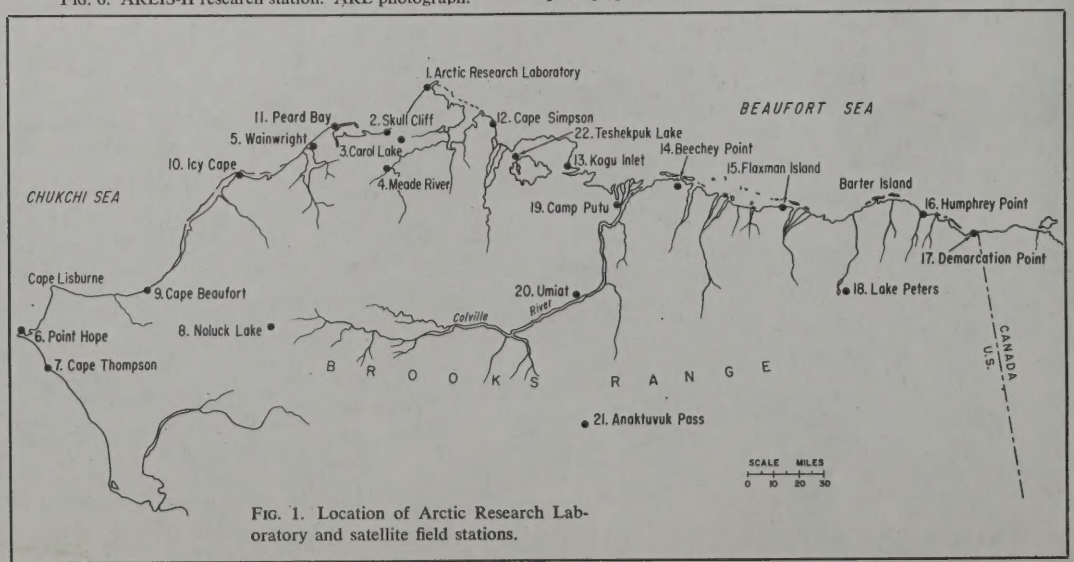


FIG. 1. Location of Arctic Research Laboratory and satellite field stations.

The Polar Times

No. 60. JUNE 1965.

Navy Rescues 18 From Melting Arctic Ice Island

Research Station Is Drifting South Into Warmer Atlantic

May 11

The Navy's drifting research station, Arlis 2, has been evacuated after riding an ice island thousands of miles over the last four years.

The last man was taken off Monday night by the icebreaker Edisto, now on her way to Iceland with the 18 men who manned the station.

The island is formed of glacier ice that once formed part of an apron attached to an Arctic island and is covered with rocks deposited on it by the glacier.

The island is now drifting past Iceland into the open sea and may be carried far south into the North Atlantic before it melts and dumps its rock load onto the ocean floor.

By WALTER SULLIVAN
The New York Times

May 8

A Navy icebreaker has reached a rocky, hilly island that is drifting down into the warm Atlantic Ocean. Her mission is to rescue 18 residents before the island melts.

For four years the island as served as a Navy research station, known as Arlis 2. It has drifted from north of Alaska, almost directly over the North Pole, and is now slipping past Iceland into the North Altlantic. The distance between is 1,500 miles.

Arlis 2 is a platter of ice about 70 feet thick. It measures two miles by a mile and a half and is sprinkled with huts as well as rocky hills. Although its surface, including its air strip, is a slushy morass, according to Navy reports, the ice beneath is still solid.

It is feared that the island may drift far south with its crown of boulders, some of them six feet in diameter, still intact. It would then constitute a serious menace to shipping.

Arlis 2 looks so much like solid land that some suspect it may have played a strange role in one of the most bitter personal disputes of the century.

The rivals, Dr. Frederick A. Cook and Robert E. Peary, both claimed discovery of the North Pole. Both claims were disputed in part because each said he had seen land far out in the Arctic Ocean where, as shown later, no land exists.

A recent issue of the journal Arctic carried a commentary on the 100th anniversary of Cook's birth. It pointed out that he may have seen an ice island, such as Arlis 2. Some have even proposed that both he and Peary sighted Arlis 2 itself. The commentary urged that Cook's claims be reconsidered.

Cook said he reached the Pole on April 21, 1908, after sighting a 50-mile stretch of land 1,000 feet high. He named it Bradley. Land for his chief backer. Peary reported reaching the Pole a year later.

The rival claims set off a controversy that has never been fully laid to rest. Cook originally had the support of the Explorer's Club in New York and The New York Herald, which later merged to form The New York Herald Tribune. He was met on his return to Annoatok by Harry Payne Whitney, uncle of John Hay Whitney, who is now publisher of The New York Herald Tribune.

Harry Payne Whitney described Cook and the two eskimos who accompanied him as "half-starved and very thin, terribly dirty and Dr. Cook, like the eskimos, had long hair reaching to his shoulders." Mr. Whitney reportedly believed Cook's story of reaching the Pole.

Peary, who had the backing of the Peary Arctic Club and The New York Times, soon won wide acceptance for his claim, whereas many doubted Cook, despite his earlier feats in both polar regions. Cook's case was further damaged when mountaineers discredited his claim of having ascended Mount McKinley, the highest peak in North America.

Cook was expelled from the Explorer's Club and later was jailed for fraud in a case unrelated to his exploration. Yet a number of explorers, such as

The New York Times May 8, 1965

The path of Arlis 2: The drift of the rock-strewn ice island and the research station on it is shown from point north of Alaska, where it was occupied four years ago, to the point near Iceland where it is now being evacuated.

U. S. Navy

Arlis 2, which appears like solid land mass, actually rests on ice, which is now melting

Roald Amundsen, stood by him. They noted that Peary, too, had reported sighting a nonexistent island, Crocker Land, on a journey toward the Pole in 1906.

The ice islands are platters of ice as much as 150 feet thick. Some are several hundred square miles in area. Most, if not all, are born from the Ward Hunt Ice Shelf, an apron of floating ice attached to the north coast of Ellesmere Island. The apron is fed by falling snow and by glaciers on the island. The glaciers carry rock from the land.

During the winter of 1961-62 the Ward Hunt Ice Shelf gave birth to a new generation of ice islands, at least three of them larger than Arlis 2. Its predecessor as a Navy station, Arlis 1, rode a floe and was short-lived. Both were established by the Arctic Research Laboratory, operated by the University of Alaska for the Office of Naval Research at Point Barrow, Alaska.

The name Arlis stands for "Arctic Research Laboratory Ice Station."

The hills on Arlis 2 are only about 50 feet high, compared to the 1,000-foot elevation claimed by Cook for Bradley Land. However, heights and distances are deceptive in the polar regions. Furthermore, as noted by present-day historians, both Cook and Peary tended to overdramatize their discoveries.

The commentary in Arctic was written by John Euller, a writer on polar matters. Walter A. Wood, president of the American Geographical Society, is among those who have recently expressed the view that Cook's claims regarding his polar journey should be re-examined.

Yesterday, the Office of Naval Research in Washington reported that the U.S.S. Edisto, after weeks of maneuvering through ice fields, had reached Arlis 2 and tied up to the island. A tractor airlifted to it as part of the station's equipment is being used to haul salvageable gear to the icebreaker. The vessel's helicopters are ferrying more fragile items.

In recent years the United States and the Soviet Union have each maintained one or two stations on the drifting ice of the Arctic Ocean. Some were on ice islands and others on the thinner ice floes.

Both nations have kept a constant record of ocean depths as wind and current carried the ice hither and yon. Samples have been hauled up from the ocean floor.

Observations have been also made of the aurora, the earth's magnetism and its gravity. Samples of sea life were collected and a variety of other observations made, too.

The Polar Times

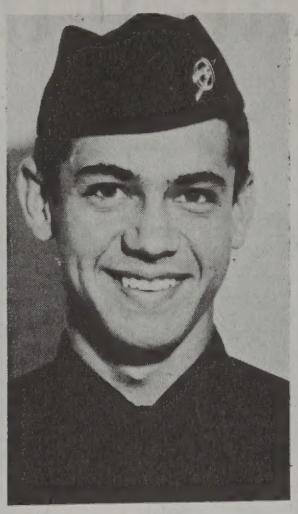
Published June and December by the
AMERICAN POLAR SOCIETY,
Care August Howard, Secretary,
98-20 62nd Drive (Apt. 7H),
Rego Park 74, New York.

AUGUST HOWARD, Editor

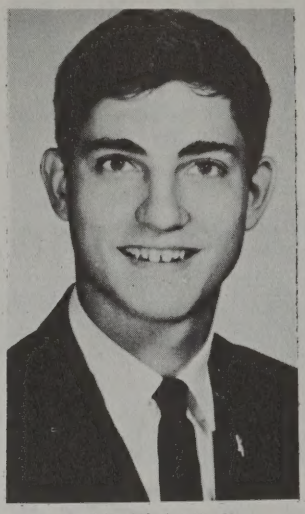
THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.



Robert D. Biggers



Bruce I. Nappi

RESUPPLY MISSION HEADS FOR ARCTIC

2 Icebreakers Lead Fleet to U.S. Station in Far North

The New York Times

June 8

The 15th annual resupply mission of military installation in the Arctic got under way yesterday with the sailing of two Coast Guard icebreakers, the Navy's Military Sea Transportation Service said.

The two icebreakers were the Westwind and the Eastwind, which sailed from here and Boston, respectively.

The Westwind, commanded by Capt. Frederick A. Goettel, sailed from the New York Naval Shipyard, Brooklyn, at 9 A.M. yesterday. Her first port of call is Thule, Greenland, near which the 269-foot vessel will spend most of her time to keep a channel open through Melville Bay and permit access by other units of this year's supply fleet.

The fleet includes seven dry-cargo ships, eleven tankers and two Navy icebreakers, the Edisto and Atka, and the Redbud.

This year's resupply mission calls for the delivery of 64,000 measurement tons (40 cubic feet to the ton) of dry cargo, slightly more than 2 million barrels of petroleum products, and the return of an as yet undetermined amount of "retrograde" cargo — shipments of supplies and materials no longer needed or being shipped back for repair and maintenance.

Another phase of the annual supply mission — the reactivation of submarine petroleum discharge lines—will again be undertaken this season by the Redbud, a small 180-foot Diesel vessel that in past years has always been the first unit of Task Force 6 to leave for northern waters. The Redbud is due to sail from Bayonne tomorrow for Goose Bay, Labrador, and Sondestrom and Thule, Greenland.

Task Force 6 is under the control of Rear Adm. Frank L. Johnson, United States Navy, who is both task force commander and commander of the M.S.T.S. Atlantic area.

The other cargo ships assigned to the task force are the civilian-manned Greenville Victory, a veteran of both Arctic and Antarctic supply missions; the Wyandot; Bondia; Sgt. Morris E. Crain; Sgt. Archer T. Gammon; and two Victory ships yet to be selected.

The Westwind is scheduled to return here in November. She is expected to be the next to last ship to return from this year's Arctic mission. The final ship will be the Redbud, which is scheduled to leave two days after the Westwind sails.

2 Scouts Picked For Alaska Task

Two Boy Scouts were selected June 16 to serve as junior scientific aids at the U. S. Navy Research Laboratory at Point Barrow, Alaska, during July and August. The pair, culled from among several hundred candidates, are Bruce I. Nappi of Kensington, Conn., and Robert D. Biggers of Whittier, Calif. The designations were made after interviews with five finalists by Gerald F. Beal, treasurer of the Boy Scouts; Dr. Max E. Britton, Arctic geographer, and Irving Feist, international commissioner of the Boy Scouts

Nuclear Subs To Carry Oil

American and Canadian petroleum industries are interested in a proposal that nuclear-powered submarine tankers be built and used to carry oil from the fields of the Arctic to European markets.

Engineers have designed a nuclear tanker submarine displacing 50,000 tons that would be able to transport 25,000 tons of oil. Such a vessel would be capable of a maximum speed of 35 knots.

Because a submarine tanker could operate under Arctic ice, a trip to Europe would be only half the length of the route that must be used by vessels traveling on the surface.

The rapidly expanding petroleum industry in Alaska would benefit especially from use of submarine tankers, experts have said.

ONR ARCTIC RESEARCH LABORATORY • Max Britton

The Arctic Research Laboratory (ARL) is a Navy-owned, contractor-operated research facility located at 71°20′ N lat, 156°46′W long about 4 miles north of Barrow, Alaska, the largest Eskimo village in the state, and about 6 miles south of Point Barrow (Fig. 1). During the past 16 years the Laboratory has played a vital role in serving the arctic research and engineering needs of the Department of Navy and many other government agencies and has assisted hundreds of scientists and technicians from academic institutions.

The intellectual vigor and imagination characteristic of the Office of Naval Research immediately following World War II stimulated recognition both of the dearth of knowledge of arctic areas and the Navy's need to understand all aspects of operating in more than 5 million square miles of arctic seas. Happily, these men of spirit, foresight, and purpose who recognized the need were able to couple ideas with action which led rapidly to the organization of both an arctic research program and a laboratory to support it. Today, as at its inception, ARL is the only U.S. laboratory devoted to full-time support of basic research in the Arctic. Its strategic position on the shore of the Arctic Ocean, at the northernmost limit of the United States, presents excellent opportunities for the attainment of research objectives in the national interest whether they be directed toward land or sea.

Biologists have played a significant and influential role in the organization and operation of ARL, and biological sciences which dominated the program in the early years remain a current source of strength. More than to any other individual, credit for establishment of ARL accrues to M. C. Shelesnyak, then Head, Human Ecology Branch, ONR. Swarthmore College held the first ONR research contract for studies at Point Barrow. Under the leadership of Laurence Irving, a party was sent north in the summer of 1947 to establish temporary research facilities and to conduct studies on the metabolism of arctic organisms. In the following year, Irving received appointment as the first Scientific Director of ARL and proceeded with a vigorous program of expanding facilities, coordinating research programs, and pursuing his own research.

The 1947 summer program staffed by seven biologists occupying a small, single-story Quonset hut was increased in 1948 to a total of 30 scientists and technicians, mostly biologists, whose work was vastly aided by the addition of improved facilities including a new 40- x 100-ft two-story Quonset building which remains today as one wing of the main laboratory. Two other biologists, George MacGinitie, then at the California Institute of Technology, and Ira L. Wiggins, Stanford University, contributed notably to the early growth phases of ARL — to the stimulation, coordination, and guidance of diverse research programs — and, at the same time, conducted their own research respectively in the fields of marine invertebrate zoology and vascular plant taxonomy and ecology. Other directors included Ted Mathews, a Fairbanks, Alaska, engineer, and G. Dallas Hanna, geologist, California Academy of Sciences.

Three academic institutions, Swarthmore College, Johns Hopkins University, and the University of Alaska, have held the ONR contract for the operation of ARL and have performed in an outstanding manner in assisting the Navy in its arctic research objectives. The University of Alaska assumed administrative functions of the Laboratory in 1953 and in 1956 appointed Max C. Brewer to the position of Director. Mr. Brewer, geologist and geophysicist, U.S. Geological Survey, brought many years of arctic experience to his position. His knowledge, zeal for action, and dedication to duty, coupled with a period of expanding funding and unqualified support from the University of Alaska, have marked his administration as the period of greatest ARL growth and progress. Mr. Brewer's staff includes John Schindler, a biologist, as Assistant Director, and 45 additional permanent administrative and service personnel. Temporary personnel are employed seasonally as required. These dedicated people, large numbers of them highly valued natives of Barrow, as a body constitute the greatest single attribute of ARL, rendering its services to research an outstanding success.

ARL occupies a number of buildings within the Navy Base Camp originally constructed in support of oil exploration within Navy Petroleum Reserve No. 4. Oil exploration ended in 1953, and the Camp is now in custody of the Office of Naval Research. Except for buildings and other facilities used directly by ARL, the Camp is licensed to the U.S. Air Force which operates it as a logistics base of the Distant Early Warning Line (DEW). The Air Force provides certain facilities and services to ARL. Common-use services such as utilities and street maintenance are furnished without cost, whereas others, such as messing, vehicle repairs, and building maintenance, are on a reimbursable basis.

The central laboratory occupies an H-shaped structure consisting of two 40- × 100-ft Quonset buildings connected by a small, single-story structure of like type. This complex includes the administrative offices, a small library-museum, BOQ, recreation rooms, research laboratories, and service rooms. Machine and carpentry shop, additional dormitories, family living quarters, aircraft hangar, garages, warehouses, radio station, and a variety of special-purpose research facilities occupy similar-type buildings scattered throughout the camp and nearby areas.

The principal role of ARL is to provide all facilities and services for fundamental research in all appropriate scientific fields related to the arctic environment. This role includes both support of laboratory studies per se and logistics services to field parties farther afield. The general area falling within the support capability of ARL lies seaward from the Brooks Range of Alaska across the Arctic Slope, but no rigid restrictions are placed upon the area of operation. Field parties are regularly supported throughout the Brooks Range and on occasion well to the south. In 1963, through cooperation of the Canadian Government, ARL aircraft assisted field parties as far north as Banks Island in the Canadian Arctic Archipelago. In the early years of the Laboratory, research was conducted primarily in the environs of Barrow, and parties farther afield had recourse only to the inconveniences and inefficiencies of tent camps. Since 1956, a continuing effort has been made toward provision of simple but more comfortable and efficient field quarters. At present, ARL operates a far-flung network of field stations (Fig. 1) which greatly enhance research accomplishments.

Field installations are of varying size and refinement. At Cape Thompson (Fig. 1, Station 7), southeast of Point Hope, a complete, fully equipped camp including vehicles, two airstrips, small boats, and all necessities for living and working are available for as many as 70 personnel. This camp, constructed by the U.S. Atomic Energy Commission for Project Chariot, was transferred to ONR for research purposes. There being no current requirement for such extensive facilities, the camp is utilized only on a restricted basis as needed. The temporary nature of existing structures requires construction of a smaller, more permanent installation, and this work is in progress.

Extensive facilities are available at Umiat (Fig. 1, Station 20) in the foothills of the Brooks Range and at Peters Lake (Fig. 1, Station 18) well within the Range. The latter station, originally established as a two-building temporary camp by the Cambridge Research Laboratory, USAF, is now a part of ARL and has been enlarged to a seven-building complex capable of accommodating several scientists the year around.

Scattered over the Arctic Slope are several stations exemplified by Camp Putu on the Colville River Delta (Fig. 1, Station 19; Fig. 4). Such stations consist of 14- × 20-ft wanigans which house as many as four men on a year-around basis. All have propane heating and cooking stoves, and some are furnished with 110 v electricity.

Field facilities are currently being expanded by procurement of eight DEW Line "I-sites" declared surplus by the Air Force. These sites (Fig. 1, Stations 9–16) are self-contained, modern, exceptionally well-constructed and well-equipped stations, which are expected to be used extensively by ARL field parties in the future. All of these stations have good airstrips and can be made available on a year-around basis but will be opened only as needs justify their use.

At sea, ARL has established and operated four drifting research stations, ARLIS I-III and Fletcher's Ice Island (T–3). ARLIC–II (Fig. 5, 6) and T–3 are major facilities on ice islands and are currently in use. The former, established by ARL in May 1961, has carried field parties along hundreds of miles of track to its April 4 position at 86° 38′ N, 48° 38′ W. Throughout its drift, its programs have included studies in marine biology under the leadership of John L. Mohr, University of Southern California. A Japanese party led by Kou Kusunoki of Hakkaido University also conducts physical and biological oceanography from this station. T–3, the venerable ice island originally occupied and for many years used as a research base by the U.S. Air Force, has been under the support of ARL since February 1962 and was on April 6 located at 80° 24′ N, 140° 10′ W. A marine biology program will be started on this station by Max Dunbar, Marine Sciences Centre, McGill University, in the spring of 1964. Temporary stations are established on the ice as needed and may be occupied for 1 day to several weeks or months. ARLIS–III is such a station currently being used by parties from the University of Alaska, University of Washington, and the Navy Oceanographic Office. It was established on pack ice in early March about 150 miles northeast of Point Barrow and will be abandoned with the coming of the melt season after about 3 months of useful service.

Investigators authorized to utilize the services of ARL receive essentially complete support including billeting, messing, cold-weather clothing, and local ground, air, and small-boat transportation. Shop facilities permit fabrication of much of the equipment required by investigators; other equipment and supplies may be procured by ARL; and highly specialized instruments are usually the responsibility of the investigator. Fleets of wheel and track-laying vehicles provide overland transportation, and a fleet of nine aircraft meets most of the challenges of arctic transport. Aircraft in the present fleet include two R4D's (C47) (Fig. 5) which are used primarily for the resupplying of drifting stations. The major part of overland flying and coverage of the sea, to about 300 miles, is accomplished by five Cessna 180 and 195 aircraft which at appropriate seasons operate on skis, wheels, ski-wheels, or floats. ARL has pioneered in light aircraft operations (Fig. 7) over the ocean for scientific purposes, and hundreds of landings have been made on unprepared ice surfaces by its staff of five highly skilled pilots. Although distances of operation to sea are normally dependent upon the gas load of the light planes, under special circumstances they are staged to greater distances by air dropping fuel along the way. In the spring of 1963, two Cessna 180's were staged via T–3 and ARLIS–II to the geographic pole in accomplishment of research objectives in geophysics.

ARL exists primarily for the support of the Department of the Navy and especially for those research projects funded by ONR. However, its facilities are made freely available to all projects which are funded by any government agency. During the full history of ARL, 28 different agencies and 56 colleges, universities, or other private research institutions have enjoyed its facilities and services. About 600 individual scientists and technicians have been assisted, many of these returning intermittently or annually.

Biological sciences have always furnished an important part of the ARL program, and the Laboratory continues to offer bright prospects for future programs of all kinds. Among 60 research programs active at ARL during the summer season of 1963, 28 involved studies in biological sciences. Of these, only 2 were under direct contract with ONR, 11 were supported by subcontracts under an ONR contract with the Arctic Institute of North America, and the remainder were funded by other government agencies.

Scientific administration of the Arctic Project, including ARL, is a function of the Geography Branch, Earth Sciences Division, ONR. Biologists interested in utilizing the services of ARL are encouraged to make inquiry to that office. Authorization to receive ARL services, however, is not given directly to individuals but only to the government agency supporting their research.

It is the continuing objective of ONR to lend every possible assistance to biologists and other scientists in attaining their arctic research goals. Current requirements for logistics services are large, and ARL capabilities are overtaxed, but, hopefully, growth of the Laboratory will keep pace in its services both to the Navy and to the valued scientists who make its programs a success.

As this is written, plans are well along for the construction of a modern laboratory complex to replace the temporary and now outmoded ARL structures which limit future progress. Planning and design are in the hands of an architect, and, hopefully, funding will become available in Fiscal Year 1965. If so, arctic biologists and other scientists will benefit by the summer of 1967.

Reprinted from *BioScience*,

Vol. 14, No. 5, 1964, pp. 44-48

SCIENTISTS REPORT ON SPECIES MOVES

Control Exerted by Bering Strait Is Noted in Study

By WALTER SULLIVAN
The New York Times

May 4

For perhaps as much as 100 million years the Bering Strait has served as a traffic light controlling movements of newly evolved species between the world's great land and water areas.

In an effort to reconstruct the role that this light has played, Soviet and American scientists have pooled knowledge gained on both sides of the strait. Their results have been published in Moscow and Washington under the names of four authors: two Soviet and two American.

The strait has exerted two-way control, according to the scientists, for when sea level has been so low that a land bridge connected the continents, the light has been red, so to speak, for the passage of newly evolved sea life between the Pacific, on the one hand, and the Atlantic and Arctic Oceans on the other.

When the sea route through the strait was closed, the land route between Asia and North America was open. Across this "bridge" spread a host of new species: camels, horses, the white pine and, ultimately, man.

Sometimes the species died out on one side but continued to evolve on the other. Thus, the horse and camel vanished from North America and the white pine disappeared from Siberia.

At least six times, however, the traffic light has changed, the sea rising and sweeping across the lowlands on both sides of the strait. The number of these "transgressions" is probably larger. There is strong evidence of a seventh, according to the Soviet-American study.

Reconstruction of the timetable, however, has been complicated by evidence that the land itself, particularly in Siberia, has been pushed up and down by forces deep within the earth.

Thus, during periods when, as shown by high beaches, ice sheets have melted and ocean levels were high, land upheavals may still have closed the straits from time to time. By the same token, a channel between the Arctic and Pacific oceans may have been split open, even during ice ages when much of the world's water was frozen and sea levels were low.

The Soviet and American scientists have therefore just begun to unravel the record, largely by studying and dating pollen grains and marine fossils found at various levels on either side of the strait. One problem is that identification of various species in the two countries does not appear uniform.

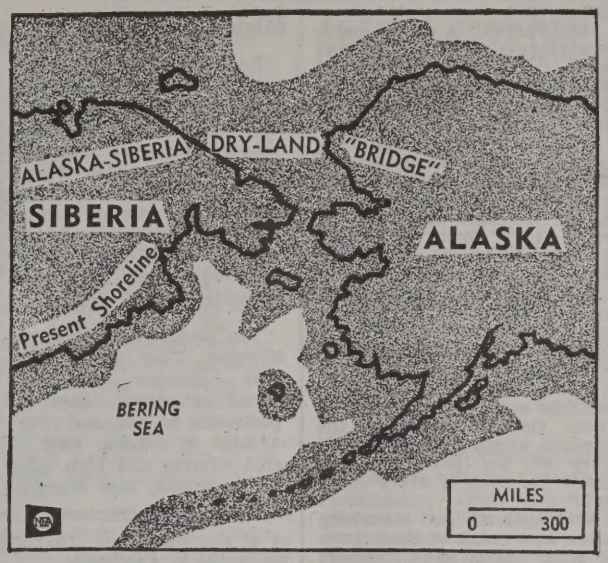
This perhaps cannot be resolved, they said in a recent issue of the American journal Science, "until an opportunity arises for American and Soviet paleontologists to examine their respective collections together."

The Soviet version of the report by the same authors appeared several months ago in Izvestia (News) of the Soviet Academy of Sciences.

The authors were Dr. David M. Hopkins and Francis S. MacNeil of the United States Geological Survey and R. C. Merklin and O. M. Petrov of the Soviet Academy of Sciences. The United States Interior Department's Geological Survey reported yesterday that the two groups had collaborated by mail.

The evidence seems to show, the Geological Survey announced, that the climate of the Alaskan - Siberian area was much milder 10 million years ago. Temperate zone trees were plentiful, for example. The last time animals and man could walk across the Bering Strait was 11,000 or 12,000 years ago.

The Soviet and American scientific collaborators may meet in August at the congress of the International Quarternary Association to be held in Boulder, Colo. Dr. Hopkins is organizing a symposium to be held during it. Anthropologists, botanists, geologists and specialists in other fields will exchange information on this bridge between the old world and the new.



LAND BRIDGE LOCATION—Department of Interior map shows location of Bering Land Bridge (shaded area), which both American and Soviet scientists believe connected Alaska and Siberia about 11 or 12 thousand years ago. Enormous quantities of water, that had been stored on land in the form of continental glaciers, finally swept over the land bridge to divide Alaska and Siberia.

Ski-March Puts Soldiers And Gear Through Icy Paces

FORT RICHARDSON, Alaska (ANF) — Six men from U.S. Army, Alaska, have just finished a trek across the Sergeant Ice Field, a 55-mile frozen wasteland in the eastern part of the state.

Completely outfitted in special test clothing and equipment, the men made the icy ski-march as part of an Army-wide study of new combat gear.

The U.S. Army, Alaska, Combat Developments Agency supervised the test for the LINCLOE study — meaning "lightweight system of individual combat clothing and equipment."

During the ten-day march, the six men were completely isolated, except for two daily radio reports. According to Army officials, they are the first men to forge across the Sergeant field.

Their food was a new Army "patrol ration," they melted snow in collapsible canteens, and rested in experimental "half sleeping bags."

Travelling as lightly as possible, the party's only heat source was a packet of Army heat pellets.

Other experimental equip ment getting the freeze test was a "pop up tent," new liners for parkas and field jackets, insulated air mattresses, and reinforced blankets.

The Canadian Army also contributed gear to the test march. Specially designed toboggans were used to carry most of the other equipment. Wind trousers, face masks, and lightweight shovels rounded out the list of items that may soon receive an enthusiastic welcome from the cold-weather soldier.

Eskimo Scouts Keep Watch For the Army in Alaska

FORT GREELY, Alaska (Canadian Press) — Eyes, ears and suspicion ring the Bering Sea and the frozen northern ice shelf of Alaska.

"I saw," "I heard" and "I suspect" are key words in the daily report to the United States Army from the 49th state's home guard—Eskimo scouts.

"They report objects drifting onto beachds, tracks in snow and strangers—anything," Maj. Perry Davis said.

"If you are camping or just visiting the area and they take a dislike to you or your equipment, you will be part of their daily radio report."

Rocket Fired in the Arctic

BARROW, Alaska, Jan. 27 (AP) — A scientific research rocket, first to be launched north of the Arctic Circle, was fired into the upper atmosphere from an indoor launching site today. The Nike Cajun rocket left a flaming orange trail as it shot through the clear Arctic sky. Nearly the entire Eskimo population turned out to watch.

Arctic Ice Floes Formidable

WASHINGTON—Arctic floes make an eerie, cracking sound, the National Geographic says. As they grind together in the grip of wind and current, they build into a pressure ridge. Huge blocks rear 40 to 50 feet into the air. Minutes later, this structure, seemingly tough as steel, may snap and crumble onto the ice below with devastating force.

ALASKANS ELATED BY REPORT ON DAM

U.S. Study Called Impetus to Rampart Project

The New York Times

FAIRBANKS, Alaska, Feb. 27—In his basement office under a cocktail lounge here, Thomas Paskvan Jr. expressed the elation many Alaskan businessmen felt over the field study on Rampart Dam by the Department of the Interior.

The study, released recently in Washington, concludes that there is a definite market for the power that would be generated by the proposed $1.2 billion hydroelectric project on the Yukon River.

Although the study does not commit the Federal Government to any position on construction of the dam, the overall analysis of the voluminous report is optimistic.

Mr. Paskvan, a vice president of the organization formed in 1963 to push the project, said of the report, "It's wonderful. Our aim is to get Rampart Dam in the 1966 Omnibus Bill."

Meanwhile, the promotional organization, Yukon Power for America, Inc., is negotiating with the Stanford Research Institute of Menlo Park, Calif., and with Ivan Block & Associates of Portland, Ore., a consulting engineering concern, for an analysis of the Interior Department study.

The promotional group believes that such an analysis would help to convince the general public, in Alaska and other states, that the project is desirable.

In a letter to the board of Yukon Power for America, a Stanford Institute economist, Eric E. Duckstad, suggested that the study be done in two phases. The first phase would be focused upon the direct and immediate economic benefits to Alaska in general, and the Rampart area in particular; the second phase would give attention to longer-range benefits.

Yukon Power for America has already asked the state to provide $65,000 to further the efforts to have the project included in the 1966 Omnibus Bill.

The Rampart site is approximately 130 miles northwest of Fairbanks. It would back up a lake 10 per cent larger than Lake Erie and its series of turbines could generate 4.7 million kilowatts of electricity, according to estimates of the United States Army Corps of Engineers.

The first serious consideration to a dam in Rampart Canyon was given in the Corps of Engineers' report on the water resources of the Yukon and Kuskokwim River basin in the fall of 1954.

Mr. Paskvan, a darkly handsome, heavy-set man of athletic build, is the owner of Tommy's Elbow Room, a cocktail lounge on downtown Second Avenue here. He is a long-time Alaskan.

"Twenty-five years ago there were lots of Alaskans against the Alaska Highway. Now some of these same people are trying to get the highway paved, because they found it brings tourists and tourist dollars," he said.

He likened the initial reluctance about the highway to some of the oppositioon to Rampart Dam that is expressed in Alaska today.

"Once this thing starts to roll," he said, "I can see lots of these diehards becoming the greatest assets for the project. They will see that it will enhance the lives of every Alaskan."

The lowering of electricity rates, as a result of cheap power being generated by Rampart Dam, would bring down the cost of living, he said. "I am a prime example of one who is concerned with the cost of living. I have eight children and my wife and myself to support."

Mighty Rampart

Rampart would impound a body of water larger than Lake Erie that would take 18 years to fill; its turbines would generate an estimated 4.7 million kilowatts of electricity (more than twice the capacity of Grand Coulee Dam in Washington, the biggest American dam in terms of power); and its cost is estimated at $2.1 billion.

The project has opponents, however. They argue, first, that cheaper electricity would not offset other impediments to industrial development in Alaska, such as cold climate and high labor costs; second, that Rampart power could not be sold at a competitive price in Washington and Oregon because of transmission costs; and finally, that the project would do irreparable damage to fish and waterfowl.

A task force named by Secretary of the Interior Stewart Udall is reviewing the field study, and 9 million acres of public land in the Rampart area have been set aside until the review is completed. Mr. Udall has emphasized that his action does not constitute a judgment on the dam's merits. Moreover, no bills for Rampart Dam have been introduced yet and no funds of any kind have been allocated.

CONSERVATION UNIT FIGHTS YUKON DAM

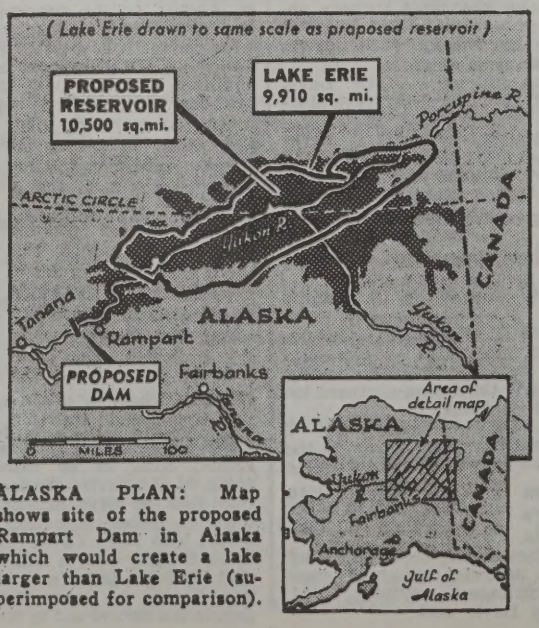
OTTAWA (Canadian Press) —The Government may be asked for help to prevent the destruction of valuable wildlife breeding grounds in Alaska.

R. C. Passmore of Ottawa, executive director of the Canadian Wildlife Federation, said in a statement that his organization, along with similarly interested groups in the United States, was to prevent construction of a proposed huge hydroelectric dam on the Yukon River at Rampart, about 100 miles northwest of Fairbanks.

He said the state-sponsored project endangered the lives of millions of waterfowl, fish and wild animals who eventually found their way to all parts of the continent.

The federation thinks the Government may be in a position to prevent construction of the dam under the Treaty of Washington, signed in 1871. The treaty contains a clause guaranteeing that navigation of the Yukon River "shall forever remain free and open to Her Majesty's subjects."

A Government spokesman has indicated that Canada has been keeping a close eye on the dam project since it was first proposed several years ago, however he stressed that plans for it were still in the very early stages and that it had not yet been approved by United States authorities.



ALASKA PLAN: Map shows site of the proposed Rampart Dam in Alaska which would create a lake larger than Lake Erie (superimposed for comparison).

U.S.-Soviet Treaty Signed On Crab Fishing Off Alaska

WASHINGTON, Feb. 6 (AP) —A United States-Soviet agreement under which the Russians will reduce their king crab fishing off Alaska and take part in conservation measures was announced by the State Department today.

Under the agreement, signed here late yesterday after a month of negotiations, the Russians are to cut their catch in the East Bering Sea by about 21 per cent in the next two years and to abandon fishing in some other areas of the United States continental shelf.

Officials said the agreement allowed a Soviet catch of 118,600 cases of king crab a year for the next two years.

Each country agreed to allow observers to check on whether fishermen are operating in accord with the terms of the pact

Canadian Scientists to Test Theory of Continental Drift

OTTAWA, Jan. 12 (AP)— Canada and Greenland are only 18 miles apart at their northern extremities. It is suspected that Greenland is sliding past Canada at the rate of about a centimeter (four-tenths of an inch) every year.

Seeking to confirm this theory, Canada is undertaking a series of measurements over a twenty year period.

This represents an attempt to settle an old argument that the world's land mass once was a single continent and that the Americas have been sliding away from Europe and Africa for millions of years. On the assumption there is drift, Greenland should be sliding north past Canada's Ellesmere Island. The 18-mile channel between the two islands offers scientists an opportunity to make precise measurements.

A-TEST TO SEEK DATA ON QUAKES

U.S. Underground Blast Off Alaska Due in November

By JACK RAYMOND
The New York Times

WASHINGTON, March 18—The United States is planning an underground nuclear test late this year on Amchitka Island, which is near the end of the Aleutian chain off Alaska.

The test, expected in November, is part of an effort to learn to distinguish between man-made nuclear explosions and natural earthquakes.

Depending on the results, officials said, the test analysis may be used to seek a comprehensive nuclear test-ban treaty in disarmament negotiations at Geneva.

The present treaty, which went into effect in October, 1963, prohibits nuclear explosions in the atmosphere, under water and in space, but permits underground tests.

The exception for underground tests was made largely on the assumption that underground tests could not be monitored accurately, and thus treaty violations could not be policed.

Amchitka Island was chosen for the test because it is in the heart of the so-called "earthquake belt" that extends about 800 miles from Kamchatka Peninsula on the Soviet Coast, near the Kurile Islands, across the Northern Pacific to Alaska.

Amchitka Island is also in the direction from which Soviet Union nuclear tests in Northern Siberia might be detected by the United States.

The Pentagon announced plans for the test after word of it had leaked. The statement said:

"The ability to locate accurately the hundreds of earthquakes which occur in the Kamchatka - Kuriles - Aleutian area annually and to distinguish them from man-made seismic disturbances might reduce the number of unidentified events and hence be of assistance in writing a comprehensive test-ban treaty."

President Johnson, the Pentagon observed, "has often expressed the hope that obstacles to a comprehensive test ban can be reduced."

News of the planned test first appeared this morning in The Seattle Post-Intelligencer.

William J. Howard, assistant to Secretary of Defense Robert S. McNamara and chairman of the Military Liaison Committee to the Atomic Energy Commission, had told Senator Warren G. Magnuson of the plan.

Senator Magnuson, Democrat of Washington, then notified The Associated Press in Seattle. Mr. Howard apparently gave him some details that were not included in the Pentagon announcement.

Senator Magnuson reported that the size of the explosion, described in the Pentagon announcement as of "low intermediate yield," would be 80 kilotons. This is the equivalent of 80,000 tons of TNT and is smaller than some of the underground nuclear tests at the Nevada Testing Site.

It was also reported in Seattle that the explosion would be at a depth of 2,300 feet.

Senator E. L. Bartlett, Democrat of Alaska, who said he had been informed of the test by the Defense Department, added that the test would be "fully contained," and that "the earth may rise a few feet and subside, but there will be no open hole at all and no contamination of the atmosphere."

Amchitka was described here as a virtually barren island with some left-behind Quonset huts and other abandoned materiel from World War II. The Pentagon discounted fears that the test might trigger an earthquake similar to the devastating shock that struck South Central Alaska last March 27.

Senate Honors Soldier Who Spared Seward

WASHINGTON, April 13 (AP) — Tribute was paid in the Senate today to George Foster Robinson, the soldier from Maine who is credited by historians with saving the life of Secretary of State William H. Seward when President Lincoln was assassinated.

On the eve of the 100th anniversary of Lincoln's slaying, Senator E. L. Barlett, Democrat of Alaska, told the Senate that at his suggestion Gov. William A. Egan of Alaska had named a 10,415-foot peak in the Chugach Mountains in honor of Seward's protector. It will be called Mount Sergeant Robinson.

Senator Margaret Chase Smith, Republican of Maine, joined Senator Bartlett in praising the actions of the Maine man in fighting off a would-be assassin of Seward.

ALASKA SEEKING CENTENNIAL FUND

Will Ask U.S. for 7.2 Million for 1967 Observance

The New York Times

FAIRBANKS, Alaska, Feb. 27 — The Federal Government will be asked for $7.2 million — equal to the purchase price the United States paid to Russia in 1867—as its share in the Alaska centennial observance planned for 1967.

This is the recommendation of the Alaska State Centennial Commission, which has been forwarded to John E. Orchard, special assistant to the director of the Bureau of International Commerce.

Mr. Orchard was assigned by the United States Department of Commerce to make a study of the extent to which the Government should participate in the centennial.

His report is expected to be presented to Congress by March 15, he told commission members during a recent visit to Alaska.

Directors of Alaska 67, the Fairbanks corporation organized to develop and operate a centennial exposition here, want $1,250,000 as their share of the Federal money. With it they propose to build a "gold rush town," a replica of a prospector's camp, which would be an integral part of the fair. The cabins would surround a main exhibit building that could remain as a permanent structure.

The corporation would also invest $1.5 million to develop the remainder of the centennial park, a 45-acre tract within the city limits.

Principal features of the exposition would include the old Yukon River steamer Nenana as a floating dance and amusement hall, a narrow gauge railway between the downtown district and the fairgrounds, an Alaskan wildlife zoo, and a program of pageants and concerts, and other programs.

The exposition would open on Memorial Day, 1967, and continue through September. It is anticipated that operating revenues would equal $1.5 million.

The local corporation, Alaska 67, recently changed its name from 67 North. Directors felt the new name would be more readily identified with Alaska's centennial year.

Pioneer Memorial Park, where the exposition will be staged, has been designated as the state's official centennial center. The tract, still in a wilderness state, is owned by the state government. Trustees on the park board represent the Pioneers of Alaska, the Tanana-Yukon Historical Society and the University of Alaska.

Prior to the centennial plans, the board had intended to build a museum, zoo and mining exhibit in the park. These plans will be carried out when the ground reverts to the Pioneers after the centennial.

The Alaska 67 organization has organized a paid staff that is preparing a membership and fund-raising campaign to finance the exposition. They are utilizing the headquarters of the Fairbanks Chamber of Commerce for their work.

Canada Seeking Access To Pacific Through Alaska

By the Canadian Press

OTTAWA, May 28—A growing U. S. desire to see the Alaska Highway paved may provide Canada with a lever to achieving access to the sea through the Alaska Panhandle.

Canadian and U. S. Legislators talked over the situation last week at meetings of the U.S.-Canada interparliamentary group. The Americans were reported to have reacted favorably.

The Canadian aim is access to the Pacific through the Panhandle, a strip of land that stretches down the coast for more than 500 miles.

The Panhandle effectively blocks the Yukon and the northern interior of British Columbia from the sea.

When the Canadian and U. S. parliamentarians met here, the Americans raised a long-standing problem: paving of the Alaska Highway, which meanders from Dawson Creek, in northeastern British Columbia, through the Yukon and into U. S. territory in Alaska.

The basis of U. S. interest in paving the highway is a study of the economy of the state of Alaska that recommends first emphasis on tourist trade.

Tourist traffic into Alaska now relies almost exclusively on coastal vessels.

The gravelled Alaska Highway, built as a World War II defense road, could provide a more important tourist link.

The Americans have let Canada known officially and unofficially that the U. S. is willing to foot almost any reasonable bill for paving the lengthy Canadian sections in B. C. and the Yukon.

Danes to End Greenland Pacts

The New York Times

COPENHAGEN, Denmark, Feb. 10—The Danish Government gave notice today that it would end preference agreements with Britain and France in eastern Greenland. Treaties were concluded in 1924 with Norway, Britain and France giving these countries special rights in eastern Greenland for trade, hunting, fishing and scientific expeditions. The treaties will be formally renounced in July and will expire in July, 1967.

CANADA STUDIES USE OF ESKIMO LANGUAGE

FROBISHER BAY, Northwest Territories (Canadian Press)—Granting residents of the eastern Arctic the right to vote for their own members of the Northwest Territories Council could mean the start of a language problem for the "Parliament of the North," according to Stuart Hodgson of Vancouver, B. C., one of the five appointed members of the territorial government. Four other members are elected from the western Arctic.

Mr. Hodgson, an official of the International Woodworkers Union, is in full agreement with the council's decision that the eastern Arctic should elect its own representatives to the council. But he believes the council has overlooked one possibility in requesting the Federal Government to establish new ridings so that the vote can be extended to all territorial residents.

It is possible and even probable, he says, that the eastern Arctic some day will name an Eskimo to represent it. The representative might insist—"and he would have a perfect right"—to speak in his own language. The same could apply to any Indian who might be elected in the Mackenzie region.

All council business now is conducted in English. English is the only language used in the Government schools that dot the territories. Some natives have complained that their children are losing their language.

Eskimos Join The Drill Team

Associated Press

EDMONTON, Alta. — Eskimos, apparently, once needed dentists like a hole in the head.

Now they get cavities like everyone else. Dr. C. H. Carley, a senior federal government dental officer, said that the Eskimo once existed on a high-protein, low-carbohydrate diet. His teeth rarely decayed. But now, many Eskimos eat the same refined high-carbohydrate foods as other Canadians — and they're paying for it in cavities.

Joint Oil Drilling

CALGARY (CP).

Three oil companies say they will co-operate in drilling a test well this summer on an island off the Arctic Ocean coast of the Northwest Territories. British American Oil Co., Ltd., Imperial Oil, Ltd., and Shell Canada, Ltd., say the well will be the first drilled in the Mackenzie River delta area.

By Russell H. Lenz, chief cartographer

Canada looks northward

Vast potential riches locked in the frozen wastes of the Arctic are beckoning Canadians. Today's explorations are scientific research efforts, but commercial development lopes close behind.

Canada's riches

By Robert Moon
The Christian Science Monitor

Ottawa

Canada seems about to open new doors to development of its vast northern reaches. The doors are partly technological, but also partly psychological.

How soon an economic reward may result from these overtures is something else again, but it is the lure of potentially vast resources that spurs Canadians northward. Brig. H. W. Love, director of the Montreal office of the Arctic Institute of North America told The Christian Science Monitor that profitable commercial returns may be realizable within five to 25 years.

Dr. Trevor Lloyd, head of the geography department at McGill University, sees the nation on the threshold of great northern development. But he believes still more government sponsored activity to be a prerequisite, for research, advance economic planning, transportation, and community facilities.

Canada now has the technical skills for these advances. And it has been in advance of other northern nations in certain of their applications.

A recent issue of Soviet Union Today, distributed by the Soviet Embassy in Ottawa, says:

"The Canadian method of conducting a complex study of mineral resources, the use of radio technical means in carrying out geographical research, the experience of organizing large expeditions, complete with several helicopters, are worthy of detailed study."

The newly discovered iron lode on Baffin Island—perhaps one of the world's largest iron fields—at once poses the deep dilemma and rich promise of the Arctic. The question is how to get the ore out economically.

Already the Canadian Government has assigned a large icebreaker to try and keep open the channel to Milne Inlet for at least three months this coming summer. By one proposal, 30,000-ton freighters would move the ore out instead of the more usual 10,000-

ton variety. But how many would be needed to move out 5,000,000 tons in three months? And is there enough ore available in accessible places?

Even if the access route proves feasible, the economic question remains: Can it be done profitably?

Oil wildcatters have continued their drilling in the Canadian north, some going to the 12,500-foot levels on Melville and Bathurst Islands.

A few months ago, one oil company paid $2,840,000 for exploration rights on some 1,900,000 acres along the Mackenzie River valley which empties northward into the Arctic ocean. The same company also filed application to explore 2,700,000 under ocean acres near the Mackenzie delta, and 1,400,000 acres on the delta itself. Other companies are also picking up rights to explore.

Further south, more roads are pushing out. The federal Northern Affairs Department plans to spend $2,012,000 this year on new roads and bridges in the Yukon. This is up by 12.2 percent over 1964.

At an over-all cost of $5,500,000, the 220-mile Watson Lake-Ross River highway is being completed into the mineral rich southeastern part of the territory.

Construction on still another new Yukon highway will start this year, end in 1968, and run 140 miles from Ross river to Carmacks through potential mining and tourist areas. It will extend the Watson lake road and provide a major link between the Alaska highway and the Whitehorse-Keno road.

For the Northwest Territories, the department is planning a $3,700,000 trunk highway to join Fort Smith, the capital, near the Alberta border, with Hay River, near the new Pine Point mining region on the south shore of Great Slave Lake. Already lead-zinc ore is moving out on the Hay River railway.

Another half million dollars is to be spent this year on road maintenance, mostly for the Mackenzie highway system serving Hay River, Yellowknife, Rae, Fort Providence, and Pine Point.

At the same time, basic research on the north continues. High up in the archipelago, stretching northward to the Pole, the Arctic Institute of North America has its Devon-Island expedition. The work: to learn the relationship between ocean and a major glacial land mass—and how they affect each other, and combine to affect the weather.

Transportation holds the key to northern development. For this reason, the institute plans to study transport problems and possibilities over a two-year period.

Various other scientific programs are under way. They include studies of environment, fish and wildlife, hydrography, submarine geology, geophysics, and geodesy.

Remote as these studies may seem to the laymen, their findings are the necessary foundation work on which must rest any future development of the rich, wild, and remote northland.

Canadians Will Confer on Steps Toward Self-Rule in the North

The New York Times

OTTAWA, May 29—The Government will begin a new effort in the coming week to bring self-government to the vast Northwest Territories.

A newly appointed commission will meet in Ottawa to devise practical steps for the political future of this backward area.

The problems, as Prime Minister Lester B. Pearson and others acknowledge, are enormous. For in an area covering one-third of the world's second largest country, no more than 25,000 people live. About half are Eskimos and Indians who have little contact with the outside world or the 20th century.

So elementary a task as forming voting districts across the great spaces poses a difficult logistics problem. Extremely intricate and formidable is the question of developing what is perhaps the richest land area in the world, in terms of natural resources, so that it will support even its tiny population.

Four years ago, the federal Government gave its northern citizens the right to vote in federal elections. The Northwest Territories and the Yukon, a territorial neighbor of Alaska, elect one member each to the Federal House of Commons.

Yukon, a political step ahead of the Northwest Territories, has its federally appointed commissioner residing in its capital, Whitehorse, and elects its own territorial council.

But the Northwest Territories' regional affairs are in the hands of B. G. Sivertz, a federally appointed commissioner whose headquarters are in Ottawa. There is no capital, and the nine-member Territorial Council has five appointed members and four elected.

Two weeks from now Mr. Sivertz will travel 1,844 miles to Yellowknife on Great Slave Lake north of Alberta for the semi-annual meeting of the council, a majority of whose members have been in the Territories for under a year.

Meanwhile, Dean A. W. R. Carrothers of the University of Western Ontario will convene the new advisory commission in Ottawa to see how, in the words of Arthur Laing, Minister of Northern Affairs and Natural Resources, "political development may keep pace with the remarkable changes occurring in the North."

Before the commission's investigation is far along, the members will hear many complaints from the North's 25,000 inhabitants.

They want more autonomy. They don't like being "treated as though we were second-class citizens." The Indians and Eskimos complain that the "white" workers sent up by the Government to develop the area live better than they do.

Ottawa officials say that Government civil service workers cannot be expected to live North of the 60th parallel as do Indians and Eskimos.

The Ottawa Government has ambitious development plans for the North. It spends more than $60 million annually on schools, roads, hospitals, illumination (an important factor in Arctic winter life), and social welfare services.

Charm of the Ookpik Is a Boon to Canada

The New York Times

TORONTO—The Ookpik, a furry toy Arctic owl born a year ago in Fort Chimo, Quebec, has become a Canadian symbol of trade promotion and goodwill. It is also a successful economic boom to the Eskimos of the Fort Chimo Cooperative Association.

The original Ookpik (Eskimo for owl), the creation of a 64-year-old Eskimo woman, Jeannie Snowball, was a stuffed, hand-crafted toy of Harp sealskin, sold through handicraft and souvenier shops in Canada.

LABRADOR AIR BASE HAS MANY COMFORTS

GOOSE BAY, Labrador (AP) — The Air Force has made its big Strategic Air Command base here as homey and almost as comfortable as bases in the continental United States. The men enjoy it.

The Goose Bay area includes the American base, a Canadian Air Force station, the town of Happy Valley and several small, outlying Indian settlements.

There are more than 10,000 American airmen and their dependents and about 2,000 Canadian military men and their families here. Happy Valley, made up almost entirely of civilians, has a population of more than 6,000. About 2,000 persons live in the outlying villages.

A sergeant, about to board a plane for Sacramento, Calif., to pick up supplies for the base, said he hoped to be back in three or four days. The temperature when he left was about 20. The sergeant was a native of South Carolina.

Facilities at the American base include a mess hall with paneled walls, murals, ultramodern lighting and tiled floor.

In a large club for noncommissioned officers, one of five on the base, American entertainers perform nightly and civilian girls working on the base are frequent guests.

TREASURES AMASSED AT ESKIMO MUSEUM

WINNIPEG, Man. (AP)—A little-known museum at Churchill, Man., 600 miles north of here on Hudson Bay, is building a collection of treasures of the fast-disappearing Eskimo culture.

There are magnificently mounted specimens of Arctic animals and birds, survival equipment dating to the time of Christ and necklaces, earings and prints, some of them centuries old.

Archeologists have authenticated and catalogued the 2,500 exhibits in the growing collection.

The Rev. René Belair of the Oblate order was a prime mover of the museum. Describing it on a recent visit to Winnipeg, he called it "the whole life of the Arctic in one place."

The Oblate order pays all costs of the museum, but Father Belair hopes for outside financial help soon. He plans to take a traveling exhibition to cities in southern Canada.

U.S. Army Scientists Continuing Polar Research in Greenland

U.S. Army scientists are carrying on a program of polar research projects in Greenland that began in 1952 and has continued with the harmonious cooperation of the Danish Government since that time.

Because three-fourths of the island lies north of the Arctic Circle, the research activities are usually conducted during the summer and fall when weather conditions are more favorable. Projects must have consent of the Danish Commission for Scientific Exploration of Greenland.

Each year, prior to commencement of operations in June, a representative of U.S. Army polar research briefs the Danish Commission on the Army's proposed scientific program in Greenland. In 1962 the Commission was briefed by the late Dr. Carl Eklund, in 1963 by Dr. Leonard S. Wilson, the chief, and this year by Donald C. Hilton, all of the U.S. Army Research Office's Environmental Sciences Division.

A number of the projects must necessarily extend over several years as, for example, the studies and tests in polar construction techniques, including foundation problems. Subsurface test structures, such as the snow tunnels at Camp Century and the ice and permafrost tunnels at Camp Tuto, must be measured periodically to study deformation and closure of these tunnels due to ice flow movements caused by pressure.

The deformation is caused by consolidation of snow under the footings of the tunnel roof arches and plastic flow of the snow when subjected to continuous loading. This results in subsidence of the roof arches and inward bulging of the snow walls.

The many facets of the Army arctic research program being carried out this year may be grouped into four areas: engineering or construction-related projects; general scientific studies such as glaciology, geology and meteorology; other scientific studies such as communications, geomagnetism and atmospheric physics; and surface transport, medical-human factors research and photo interpretation.

Using a thermal type of coring device, which achieved a depth of nearly 1,000 feet last summer, Army scientists are investigating changes which take place in the icecap interior and studying entrapped particulates within the ice itself.

Mr. Hilton explained in detail to members of the Danish Commission what the U.S. Army hopes to learn from study of the ice cores:

- From stratigraphy — whether any particular year was climatically mild or rigorous and the depth to which each year's precipitation sinks after falling on the surface, (an accumulation of thousands of years in the case of the deep layers).
- From a study of the entrapped particulates—the years when severe volcanic disturbances occurred and the years of severe drought.
- From an analysis of air trapped within the ice—the chemical composition of the atmosphere of past ages.
- From extra-terrestrial particles —those years having an occurrence of unusual meteoric activity.

Also of interest to Army polar scientists are soil studies such as frost action involved in the formation of the polygonal ground pattern common in permafrost regions and the sorting phenomena in areas of deep frost penetration which results in the segregation of coarse material from fine.

The Army has been developing ice-sounding techniques expected to yield a rapid means for obtaining the topography of the underlying bed rock.

Electromagnetic waves of particular frequencies readily penetrate the ice and it is hoped that a method can be perfected which will be more suitable than the slow, laborious seismic method used in the past.

The meteorological program also is being continued in the Camp Tuto and Camp Century area. There Army meteorologists have been amassing data concerning the boundary layer (the lower 100 feet of the atmosphere) for the past 3½ years. Until this year, two additional locations were used.

Army meteorologists maintain that the data should be continuous for at least five years to be of maximum usefulness. Related to the meteorological program is an investigation of light transmission over snow surfaces, intended to reveal a clearer insight into the radiation processes taking place immediately above the snow surface.

Other projects include such communications methods as electromagnetic wave propagation through the atmosphere and acoustical transmission through the ice.

Last summer, Army scientists in Greenland conducted experiments with long (up to five miles in length) radio antennas laid directly on snow 1,700 to 2,000 meters thick. Because of the low electrical conductivity of snow and ice, they were, in effect, suspended 1,700 to 2,000 meters above the ground surface. Experiments were described as highly successful and are continuing this year.

This summer an antenna is to be inserted 300 meters deep into the ice to conduct experiments with through-ice radio wave propagation.

Other current investigations involve problems of surface transportation, explosive-induced shock waves in ice and snow, and the imaging of surface features by airborne sensors. During all operations, personnel are observed by Army doctors for any physiological or psychological effects due to arctic environment.

Science Probes Origin of Eskimos

WASHINGTON.—Who are the Eskimos and where from?

Their incredibly hardy race occupies an enormous area of the earth's surface, where other humans cannot long survive and in which Europeans with preserved meat, beans and coal stoves have starved and frozen to death by shiploads.

The Eskimos, however, continue to survive, with only the most primitive of equipment.

Throughout their area, organized into many tribes, they share a common culture although there hardly could have been much communication between them through the ages.

Arctic archaeology is slowly getting near the bottom of the problem, although it is far from solved, says Dr. John M. Campbell of the University of New Mexico in a report recently published by Science, official journal of the American Association for the Advancement on Science.

The report points out that Eskimos are members of the Mongolian branch of the human race which includes most of the people of Asia and the North American Indians.

There are traces of both Asian and Indian origin in their culture, it is explained, but all the indications are that these were borrowings after they were well established as Eskimos.

About all that can be said now, says the report, is that Eskimo culture seems to have begun on the shores of a far northern sea.

North American Newspaper Alliance

Biggest Nonpolar Glacier

The Malaspina Glacier in southeastern Alaska is the largest glacier in the world outside the polar regions, The National Geographic says. The giant ice mass covers 1,500 square miles, an area larger than Rhode Island.

RUSSIANS PERMIT ARCTIC CITY VISIT

Canadians First From West to Tour Norilsk Mines

By THEODORE SHABAD
The New York Times

MOSCOW, June 12—A Canadian Government delegation on a tour of Siberia has become the first Western group to visit Norilsk, an Arctic city founded under Stalin by forced labor.

The Canadian group, headed by Arthur Laing, Minister of Northern Affairs and National Resources, returned from the mining center within the Arctic Circle impressed by what members described as an "extremely modern city" of 100,000 inhabitants. The development of the nickel-copper deposits there began in the middle thirties.

Norilsk, one of the country's leading nickel and copper producers, roughly at the latitude of the north coast of Alaska, was not on the original itinerary planned for the Canadians in their two-week tour of Siberian construction sites.

"We asked our hosts to show us some of their Arctic cities, "Mr. Laing said yesterday at a news conference, "and they added Norilsk."

When asked why the city should be closed to foreigners, a member of Mr. Laing's party said:

"I have no idea. On the contrary, they have something to show up there."

Observers familiar with the Soviet economy suggested that the restrictions against visits to Norilsk were probably related to the secrecy that surrounds the entire nonferrous metals industry of the Soviet Union. In addition to the basic copper and nickel output, the rich ores of the Norilsk area yield a wide range of rare and precious metals such as platinum, palladium and cobalt.

The Canadians, who had expressed interest in studying Soviet construction methods in the permafrost, or permanently frozen subsoil found in half of Siberia, said they had been impressed by the Russians' ability to build nine-story buildings in Norilsk.

"In Canada, we are not building anything heavier than two-story buildings under such conditions," Mr. Laing said.

Permafrost presents a special problem for northern construction workers because it causes buildings to settle unevenly during a surface thaw. The Canadians said the technique most widespread in the Soviet Union was to drive piles into the permafrost to a depth of about 15 feet and to build foundations on the piles.

Now forced labor is no longer used, and the visitors reported that the basic pay scale in Norilsk was 80 per cent higher than in the country's temperate climate. The aim is to induce workers to go to the northern city with its six-month winter and many weeks of polar night in December and January.

In addition to the higher base pay, the Canadians were told, the workers receive a 10 per cent bonus for each year they have spent at Norlisk up to a maximum of 200 per cent.

Despite the Soviet effort to reduce the labor force in the Far North, the Canadians found far more workers employed in Siberian industries than in installations of comparable size in Canada.

"We use more automation and mechanization in Canada," one delegation member said.

"We would use about one-fourth of the labor that we found employed at the ore concentrator of Norilsk."

The New York Times June 13, 1965
CITY IN THE ARCTIC: A delegation of Canadians visited Norilsk (cross).

Soviet Vessel Is Accused Of Violating Fishing Pact

WASHINGTON, June 24 (AP)—A Russian ship violated a United States-Soviet fishing agreement by taking king crab near Unimak Island, Alaska, the Treasury said Thursday.

The State Department issued a protest to the Soviet embassy here on the basis of a Coast Guard report of the incident last Monday.

The Coast Guard said its cutter Storis spotted the Russian vessel Konstantin Sukhanov, with seven fishing boats in the water, about 25 miles south of Unimak. The Treasury said this location is outside the area agreed upon for Soviet king crab fishing in a Feb. 5 accord.

The Storis said preliminary attempts to make radio contact were unsuccessful. The Russian vessel picked up its boats late Tuesday afternoon and proceeded into the Bering Sea.

New Soviet Arctic Station, North Pole 14, Is Operating

The New York Times

MOSCOW, April 24—A new Soviet research station, called North Pole 14, is now in operation on an Arctic ice floe.

According to the newspaper Sovetskaya Rossiya, the station was established earlier this month about 400 miles north of Wrangel Island off Siberia.

Last month Soviet polar fliers evacuated the staff of another station, North Pole 12, which had drifted far from the Soviet mainland since its establishment in April of 1963. Automatic weather recording and reporting stations were installed on the abandoned floe.

North Pole 13, now 800 miles from the Siberian coast, will continue in operation under a new crew that relieved the station's winter team last month.

MUSK HAIR FOUND SOFT AS CASHMERE

COLLEGE, Alaska (Science Service)—The long slender underwool of the Arctic musk ox is being tested by woolen manufacturers who compare it favorably with cashmere.

The soft fiber of the musk ox is similar to cashmere but about twice as long and half as thick, according to Dr. John J. Teal, administrator of a project to domesticate the rare, shaggy animal of the Arctic regions. It can be prepared using the same machines as those used for cashmere.

Each year an adult musk ox can produce about six pounds of underwool. About eight ounces are needed to make a sweater.

The wool does not shrink when knitted into a garment and it can be bleached or dyed any color.

Since the raw wool could sell for about $50 a pound, Dr. Teal believes this animal could provide an important addition to the economy of the Far North. The meat, which tastes much like beef, and hides, are also of superior quality, he said.

With a five-year grant from the W. K. Kellogg Foundation, Dr. Teal has already succeeded in taming the animals to the point where they accept a daily routine of being weighed and led into a small stall. They are herdsmen, Dr. Teal reported and like to play games with them.

The musk ox, which has some characteristics of the ox and the sheep, used to inhabit Siberia, the plains of Northern Europe, and parts of the British Isles and North America. Now only a single species remains, in northern Canada and Greenland.

Weighing 500 to 900 pounds, these thick-coated mammals could serve as a source of food, Dr. John J. Teal Jr., administrator of the project, believes.

Soviet Reports Sinking Of 4 Trawlers in Storm

The New York Times Feb. 12, 1965
Disaster area (cross)

The New York Times

MOSCOW, Feb. 11—At least 100 Soviet fishermen are believed to have drowned in the sinking of four oceangoing trawlers in icy gales in the Bering Sea. There was one survivor.

The disaster occurred last month in a storm with winds up to 75 miles an hour at temperatures as low as 6 degrees below zero. It was disclosed in the Soviet press today after a two-week search by planes and more than 100 ships failed to turn up traces of the missing fishermen. Only a few pieces of the ship's gear were found.

Four medium fishing trawlers—the Boksitogorsk, the Sevsk, the Sebezh and the Nakhichevan—were involved. A medium trawler is about 140 feet long, with a complement estimated at 25 to 30 officers and seamen.

According to the official press agency Tass, a flotilla of several dozen large and medium trawlers was caught apparently along the southern margin of the icefield that covers the shallow northern half of the Bering Sea most of the year.

2,250-Mile Copter Route Is Opened in Greenland

GODTHAAB, Greenland, June 2 (Reuters)—Service began here yesterday on the world's longest all-helicopter airline route, linking 19 towns. It brings modern transport to an area in which the dogsled has been the usual means of travel.

Twin-jet Sikorsky S-61-N helicopters from Greenlandair, Inc., will make 10 double flights weekly along Greenlands' rugged west coast in a tour totaling 2,250 miles.

Freezers to Eskimos

Copenhagen, June 3 (UPI)—The government-run Royal Greenland Trading Co. announced today it has sold almost 1,500 home freezers to Eskimos in Greenland.

ICEBERGS TO SHOW COLORS THIS YEAR

They Will Be Marked to Keep Track of Drift

By WERNER BAMBERGER
The New York Times

Feb 13

Roses are red and sparkling with dew but icebergs this year will sport four shades of blue.

This oceanographic fashion note was released last week in time for St. Valentine's Day by the Coast Guard in Washington with word that the 1965 season of the International Ice Patrol would get under way late this month or early in March.

The accent in this year's annual hunt for the seasonal menace to Atlantic shipping, a service spokesman said, will be on applying the latest refinements in scientific skills.

Among the latest refinements, he said, will be the use of bow and arrow to mark icebergs with easily identifiable color patches.

Arrows tipped with color tubes containing six different colors—red, green and four shades of blue—will be shot at drifting icebergs from the deck of the Coast Guard oceanographic research vessel Evergreen from a distance of 100 to 150 yards.

Marking bergs with color patches, it was explained, makes it easier for Coast Guard scientists to keep track of them as they drift at sea. Bergs tend to break up and change configuration or shift position in the water thus making it difficult to tell its identity.

The two primary scientific questions to be explored by this year's patrol, in addition to its annual task of iceberg location and warning work, will be berg drift and berg deterioration, the service spokesman said.

To help achieve these two aims, the Coast Guard will use new water sampling techniques this year. It is hoped that by rearranging and increasing the number of water sampling stations, the service will be able to assemble accurate iceberg drift charts within seven or eight days. In previous years it took three to four weeks to draw such a chart.

In its efforts to learn more about iceberg drift and the origin of icebergs, the Coast Guard has planned two special projects for this season.

The first is a post-season study, probably in August, to determine whether the Labrador Current, a cold current of water that carries icebergs southward, originates primarily in the Hudson Bay area.

The second project will involve inspection trips to the west coast of Greenland in an effort to determine at which specific glaciers icebergs are "calved" or born.

Another subject to be studied is variations in sea levels. It was explained that there are differences in water heights in the ocean that cause water to flow "downhill." However, in doing so, ocean water is usually deflected to the right because of gravitational forces. Exploration of this phenomenon is expected to shed additional light on currents and drift.

This year's International Ice Patrol will be under the command of Capt. Richard L. Fuller. Patrol headquarters at Argentia, Newfoundland, are expected to be activated shortly.

Assigned to the patrol, in addition to the Evergreen, are a a number of C-130 planes and the cutter Acushnet, which will be kept on standby duty unless and until an exceptionally heavy incursion of icebergs into trans-Atlantic shipping lanes requires her services.

Initial and preliminary ice survey flights were begun earlier this month.

In announcing the start of the current ice patrol season to mariners, the Coast Guard noted that the patrol's primary objective was to provide timely information and warning to shipping.

The Coast Guard invited mariners to participate in the patrol by supplying the Coast Guard with periodic reports on ice sightings and concluded the invitation with this warning:

"Carefully conducted tests in the past have proven that radar cannot provide positive assurance for iceberg detection. Radar is a valuable aid but its use cannot replace the traditional caution exercised in a passage across the Grand Banks during the ice season."

The best way to keep ships from colliding with icebergs is to warn pilots about their exact location, said Lieut. Comdr. Ronald C. Kollmeyer, a Coast Guard oceanographer.

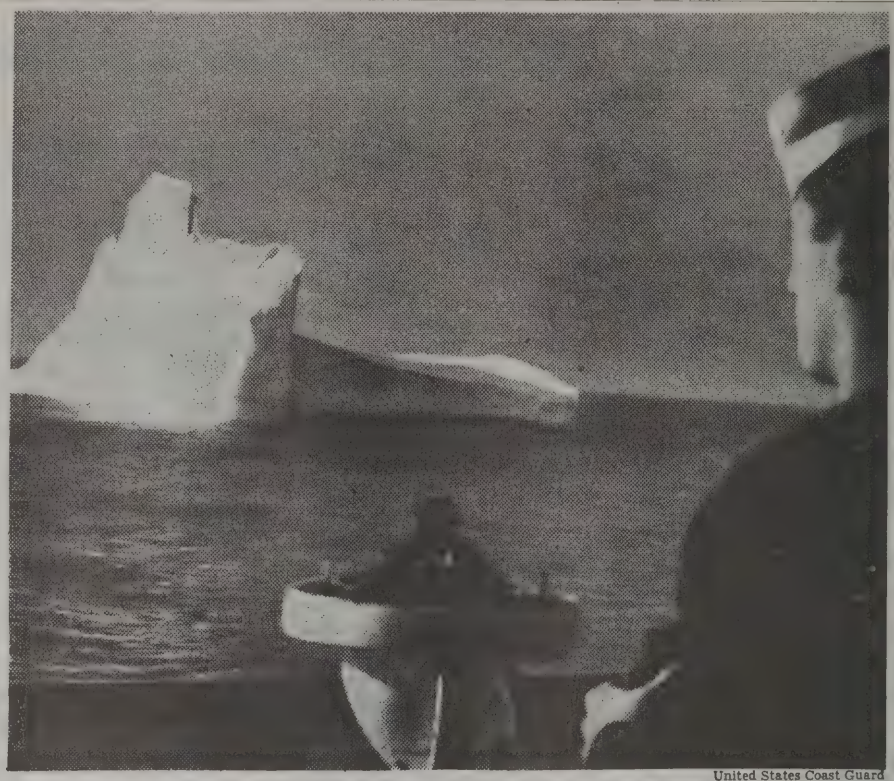
Man still has not learned how to destroy icebergs, he said. Researchers have tried high-intensity fire bombs, shooting them with cannons and covering them with lampblack—to trap the heat from the sun and melt them—to no avail.

Icebergs break away from glaciers and slide into the sea. Nine-tenths of their bulk is usually under water. On the average, 20,000 icebergs form each year, but only about 40 are large enough to worry scientists and the shipping industry, Commander Kollmeyer reports. Most of the others hit ground or drift into the Gulf Stream and melt in a week or ten days.

This year the Coast Guard will use an oceanographic radar-transmitting buoy to serve as a fixed point from which ships can measure iceberg movements with information from Coast Guard planes.

The Coast Guard maintains an air base in Argentia, Newfoundland and during the most dangerous months from February to July, flights are increased to patrol the drifting icebergs and warn vessels of their movements.

The Coast Guard is also trying to determine rates and causes of melting, and influences on drift.



United States Coast Guard

ICEBERG PATROL: Crewman studying sharp-pinnacled iceberg from bridge of Coast Guard cutter Evergreen during last year's International Ice Patrol.

Big Hike Is Set By Soldiers, Dogs

March 15

FAIRBANKS, Alaska (AP) — Twelve soldiers and a dog team will start a 150-mile hike Monday across treeless countryside, a frozen river and the ice of Bering Strait to a destination 35 miles from Soviet soil.

They are members of a U.S. Army intelligence patrol called Arctic Lemming. The men are volunteers from the infantry and Signal Corps.

The hike was described as a survival trip.

This weekend they fly by helicopter to the tiny Eskimo village of Taylor on Seward Peninsula, about 400 miles west of here, to start the hike to the village of Wales. Wales is 35 miles from the Soviet island Big Diomede.

COMPUTER AN AID IN OCEAN STUDIES

Statistical Tasks Are Eased During Ice Patrol Season

The New York Times

June 14

Data-processing computers have accomplished for mathematicians what the wheel did for transportation, an oceanographic officer on the Coast Guard vessel Evergreen remarked last week.

During the 1964 International Ice Patrol season, he said, the PDP-5 (Program Data Processing) computer aboard the Evergreen reduced to minutes the long hours of drudgery previously involved in gathering, recording, sorting, analyzing and storing statistical information.

The information was required for charts that are used to predict the speed and course of icebergs drifting into major ship lanes near the Grand Banks, off Newfoundland.

The PDP-5, which occupied a space equivalent to that needed for five or six filing cabinets, was unveiled about two years ago. Its price was $26,000.

Last week the Digital Equipment Corporation announced that a more compact and more efficient successor, the PDP-8, was being produced for sale at $18,000, and that about 160 of them had been sold in the last few months. (The PDP-6 and PDP-7 units are larger, more costly units designed for large-scale research.)

In addition to their role as analyzer, computers are used ashore as well as aboard ship to study the sea, the life within it, the earth beneath it and the air above it.

In its role as navigator the PDP-8—and its predecessor PDP-5—pinpoints the position of the ship, using fix data received by radio from artificial earth satellites. With a computer aboard, scientists can record precise positions in which each reading is taken while, simultaneously, the computer is doing other work.

Its design engineers say that the PDP-8 can work with as many as 24 remote teletype stations. They say it can exchange information with 190 other pieces of information equipment at one time, sending and receiving simultaneously. In effect, it can analyze data while gathering it.

Last year, when the PDP-5 was first used by the Coast Guard on ice patrol duty, data were taken at more than 450 oceanographic stations. The result of this simultaneous work was that the computer shortened the time needed to perform the calculations on iceberg size and movement from three hours per station to 15 minutes.

The computer also made possible complete processing of the data while the ice patrol ships were still at sea. This eliminated the calculating that had to be done ashore after the ship had docked.

The PDP-8 is scheduled to be installed on oceanographic vessels like the Atlantis II, which began a 10-month cruise in the Indian Ocean last January.

The PDP-5 now aboard the Atlantis II is being used to study currents, depths and sea life. With this information scientists may be able to help nations of the Middle and Far East get more food from the sea.

Dig They Must, Way, Way Down

ANCHORAGE, Alaska (AP)—Drilling equipment is being moved into the Eielson Air Force Base area near Fairbanks to start work on a deep shaft which reportedly will go to a depth of between 5,000 and 10,000 feet, the Anchorage Times reports.

The military has not announced the purpose of the shaft, although speculation has centered around its possible use for detection of earth disturbances, such as those caused by underground nuclear explosions.

The drilling project was disclosed Jan. 5. Two days later, in response to queries, the Alaska Air Command issued a statement saying:

"The drilling at Eielson Air Force base is part of a classified research project being carried out by the United States Air Force."

Danes Seek to Stamp Out Rabies in Greenland Foxes

COPENHAGEN, Denmark (AP)—The Government asked Parliament recently for funds to stamp out an epidemic of rabies among polar foxes in Greenland.

Carl P. Jensen, Minister for Greenland, told Parliament the foxes were now attacking humans as well as animals as the Arctic winter forces them into towns and isolated settlements in desperate search for food.

Many sheep have been bitten and died of rabies but serum treatment has so far proved effective for humans attacked, Mr. Jensen added.

He asked for authority to put up a reward of 50 kroner (about $7.30) for every fox shot in Greenland and, in requesting a total of 20,000 kroner ($2,920) as a first installment toward this end, indicated at least 400 polar foxes must be killed this winter in the districts of Narssaq and Julianehaab near the southern tip of Greenland.

ICE PATROL TO END UNEVENTFUL YEAR

Season Cut Short Because of Lack of Hazards

The New York Times

June 5

The Coast Guard's International Ice Patrol will conclude tomorrow one of the shortest and most uneventful seasons since the patrol's establishment in 1914.

Coast Guard sources said here yesterday that only about 80 icebergs, compared with a normal total of 380, had drifted into the North Atlantic shipping lanes off the Grand Banks of Newfoundland.

Dye marking of icebergs was tried for the first time this year to determine iceberg drift and deterioration. But the effort was limited by the low number of icebergs sighted.

Only six icebergs were hit by the Coast Guard archers who used arrows tipped with a blue marker.

A Coast Guard spokesman however, termed the archery experiment a success since all targets were hit. "We were able to hit one berg 60 feet above the water line and the dye remained visible for 10 days," the spokesman said.

The current season was declared ended about three weeks earlier than the normal closing date of about July 1.

The season, which started late in February, was ended because Capt. Richard L. Fuller, patrol commander, found that the chance of ice hazards to vessels traveling the prescribed North Atlantic and Canadian ocean tracks had vanished.

The work of this season's patrol, it was explained, was aided considerably by monthly aerial survey flights that were started last October. These flights to northern waters west off Greenland enabled the Coast Guard to keep a tally on icebergs afloat and to recheck their location every month by using ice drift prediction charts.

One phase of ice patrol work—the study of ocean currents and their effect on drift patterns—will be continued later this summer.

The cutter Evergreen, a vessel specially equipped for oceanographic work, will make a cruise to Labrador, Hudson Strait and the east coast of Baffin Island to determine the effects of the Labrador Current on bergs.

This cold current carries southward the icebergs spawned by glaciers on the west coast of Greenland after they have drifted across Baffin Bay.

Two large aircraft, stationed at the Coast Guard Air Station at Argentia, Nfld., in addition to the Evergreen, took part in this season's patrol work. Also assigned to the patrol on a stand-by basis were the cutters Acushnet, based at Portland, Me., and Tamoroa, based here. Their services were not required because of the light incidence of icebrgs.

The first International Ice Patrol saw duty in 1914. The sinking of the British liner Titanic two years earlier prompted the patrol's establishment.

150 Attended Cook Centenary

Plaque Dedicated To Famed Arctic Explorer.

More than 150 persons attended the Cook Centenary celebration at Hortonville on Sunday, June 13, 1965 despite temperatures in the fifties. Each of the speakers enlightened the audience on some phase of the life of Dr. Frederick Albert Cook, who was born in Hortonville on June 10, 1865. In addition to celebrating the 100th anniversary of the birth of Dr. Cook, the ceremony marked the dedication of a roadside marker to be placed near Dr. Cook's birthplace, the present Lawrence Mauer home.

Justice Richard Ried of the Town of Delaware acted as master of ceremonies and touched upon Dr. Cook's literary career in his speech. Russell Gibbons, editor of the Hamburg Sun and secretary of the Dr. Frederick A. Cook Society, outlined the recent events which have served to strengthen the belief in Dr. Cook's claim that he was the first man to reach the North Pole. He also enumerated the various experts in the field who have come to believe in Dr. Cook.

Town Historian Valleau C. Curtis touched upon the many achievements of Doctor Cook in allied fields, such as his study of natives of the Arctic region, his survival studies, medical discoveries and his literary career.

Mrs. Elliott J. Vetter, daughter of Dr. Cook, reflected that a celebrity such as her father, has little time for home and family but that his family realized that he was a man of the ages.

Are the Days Of the Arctic's King Running Out?

By ROBERT MURPHY

FOR most animals there is an area that they can call home. It varies in size according to their requirements and they hesitate to leave, for in it they know where food can be found, where they can be most comfortable during the different seasons of the year, and how best to get along within its limits. Some of them have two territories and migrate between them seasonally, but they seldom stray far from the route.

Among the more interesting animals that make the exceptions is the polar bear. This great white creature, which looks deceptively benign as it clowns about with its fellows in the zoo, apparently has no home at all—or perhaps it would be better to say it has the largest home of all. It has no attachment to any place in particular; it ranges inside the entire Arctic Circle and sometimes 800 miles or so below it, wherever the edge of the ice or the land meets the water, for this is its favorite hunting ground. It is more a marine animal than an animal of the land, an expert swimmer and diver, happiest in the water. It has been seen paddling comfortably along far from the sight of shore, or riding on broken and drifting ice 200 miles from land and apparently completely unconcerned with its destination.

It is this proclivity for wandering that may doom the polar bear, now disappearing so rapidly that recently Secretary of the Interior Stewart L. Udall included it on a list of animals threatened with extinction. The reason is that the bear's wide range of travels has made it almost impossible to limit the number killed by sportsmen, particularly in Alaska, where the hunting pressure has been very heavy. When hunters had to move about by dogsled or boat, the territory they could cover was comparatively limited, but the light airplane has changed that. The situation is of such concern to both Secretary Udall and Senator E. L. (Bob) Bartlett, Democrat of Alaska, that they are pressing for an international treaty that would prohibit hunting from airplanes anywhere.

ROBERT MURPHY specializes in writing about nature. His most recent book is "The Pond."

A KING DEPOSED

AT one time the polar bear hadn't much concern about enemies. Its territory was so vast and so thinly populated that if it happened to encounter a spear-carrying Eskimo and his wolfish dogs it often gave as good as it got and sometimes a bit better. Crafty, strong, and a woeful fighter, well protected by several inches of thick, glossy hair, a waterproof undercoat and a tough hide, it is amazingly agile for all its clumsy appearance. Any Eskimo who tangled with it was fortunate if he got out of the fracas with a dead bear, his own whole skin, and all the dogs he'd started with.

Aside from such contretemps the polar bear pretty much ruled his world, but times changed; explorers and whalers with rifles appeared in the king's domain, and traders followed them. Everyone who carried a rifle shot at the bears, whether he needed them or not, for they were big and exciting targets. Rifles came into use among the Eskimos, and the balance of power changed. The bear's huge skin, which made such a fine trophy or a striking and luxurious rug, began to appear in the fur trade, and by the turn of the century about 150 of them a year were being sent out of Canada.

Probably the number has not greatly increased and may even have diminished, for the Northwest Territories are now closed to white hunters and only Eskimos can hunt there. They eat the bears—with the exception of the liver, which is so rich in vitamins as to be poisonous—or feed them to their dogs. Once used to make mittens and trousers, the skins are mostly traded now; they are worth too much to be used for haberdashery. A few years ago a raw skin could be picked up occasionally around the northern Hudson's Bay Company posts for about $50; the current New York price for rugs is in the neighborhood of $700.

Trophy hunting by white men is no more popular with the Eskimos than the wasteful slaughter of the buffalo was with the American Indians; it seems to them a wasteful killing of an animal that they consider a resource.

A LOT OF BEAR

THE Kodiak, or Alaskan brown bear, is generally thought of as the largest four-footed carnivore in the world and big males run to a weight of 1,500 pounds or so, but there are records of polar bears that weighed as much These were giants of the clan; the average weight for males runs between 900 and 1,000 pounds, and females average about 200 pounds less. This is a considerable bear, somewhat heavier than a grizzly and three times as heavy as a black.

In zoos they have lived as long as 30 years or more, and although in the wild they are usually solitary, in captivity they will adjust sufficiently to play together, wrestling or having long games of catch. They are always potentially dangerous; careless people getting too close to the bears have been killed by them. They are intelligent, sly and patient, and will take swift advantage of a chance to wreck an onlooker. Many hunters have had the tables turned on them and been stalked by their quarry, sometimes providing the quarry with a meal, and many an Eskimo watching at a seal's blowhole has had his chilly vigil ended by a hungry bear.

The polar bear's long, snaky neck and small head set it a little apart from its cousins. When it stands on its hind legs and stretches its neck to reconnoiter the nose is 10 feet or more in the air. A polar bear can move with catlike speed and agility, far outrun a man on the level and do better than that through rocks or broken ice.

Its hearing is not very acute, for most of its life is spent amid thunderously crashing ice and noisy water, and it has little opportunity to hunt by sound. Other senses make up for this lack. Its

sight is very good—its eyes have membranes to filter out the glare of the sun on snow—and its sense of smell is superb. Many travelers have reported seeing numbers of bears gathered around the carcasses of beached whales, having scented them from great distances.

THE HUNTER HUNTS

ALTHOUGH the polar bear works hard for a living in a bleak world, he has his jovial moments. Dr. E. Kent Kane, the scientist and Arctic explorer, who had many encounters with them in the eighteen-fifties while his ship was icebound for two years, mentions a polar-bear party. The bears broke into a cache, tossed 80-pound iron pemmican cases around like footballs, smashed into splinters a heavy iron-bound alcohol case, rolled bread-barrels about on the ice, tied a stiff India-rubber cloth into innumerable knots, and then repeatedly slid down a long ice slope on their hind quarters like coasting children celebrating a successful raid on the cookie jar.

On this festive occasion they seemed to relish particularly ground coffee, old canvas, and the flag erected over the cache. In more sober hours they will eat the grass, roots and berries of summer, eggs of nesting birds, carrion washed up or anything they can catch.

A polar bear's staff of life, however, is the seal. These creatures come up on the summer ice to sleep or sun themselves, at the edge of a floe or beside an escape hole in an icefield. Having viewed the seal, the bear will crouch down, fold its forepaws under it, and pushing itself along with its hind feet, inch forward when the seal naps and stop when it raises its head to look about. If the bear can get close enough to its suspicious quarry a quick dash may get it a dinner. If it sees a seal from the water, it may dive and swim beneath the ice to the seal's escape hole, tap on the underside of the ice, and grab the startled seal as it dives through the hole.

But many seals are too wary for the bear, and if he gets hungry enough he may risk battle with a herd of walrus sleeping on the ice. They are three times his size and their tusks can make short work of him, but there may be a baby. Low in the water, with only his eyes and nose above the surface, the bear approaches on his watery stalk, and sees several babies sleeping beside their snoring mothers. He drifts to the edge of the ice, bounces out upon it, and with a rush seizes the huge infant and tries to drag it farther from the water's edge, where the herd will have trouble following him.

He may get away with it, but in any event there is immediate uproar. At the calf's bleat of pain and terror the mother starts after the attacker and the entire herd heaves into action. If the bear is lucky he will get the calf beyond reach, but if he is not—if the herd catches up with him or the ice breaks and they all find themselves in the water—he will have to get away as fast as he can, inland; in the water, for all its huge bulk, the walrus is faster.

There is a curious story, which well may be true, of another way in which the bear deals with the walrus. A walrus's hide is too thick and too tough even for a bear's claws and teeth, so the bear shoulders a great ice block, approaches the sleeping walrus on his hind legs and drops the block on the walrus's head.

HUNTING THE HUNTER

THERE has never been agreement on the question of how polar bears feel about men. Many have calmly allowed themselves to be shot and others have turned tail at the sight of a hunter. There have been many others, however, that have stalked men, moved into Eskimo villages or camps and taken on all comers, or attacked boats or boarded ships without any apparent fear.

Females will always defend their young and are troublesome characters to stir up. A mother produces cubs every other year and nearly always two, the size of rats. She will go inland to dig a den, and snooze there until the young come into the world. When spring comes she will dig her way out and head for the edge of the ice again, ready to fight to the death to defend the little cubs.

Except perhaps for the mothers, polar bears were more militant in the old days than they are now, as were grizzlies and Kodiaks. Not being stupid beasts, they have learned that the odds for a successful pass at the gentleman in the parka are not as good as they used to be.

But the polar bear has managed to survive in a very difficult environment with every man's hand against him. Or, at least, he has managed to survive until now. Whether he will continue to do so has become a question. It should not be, for what there is left of his race should be held in trust for future generations to know.

THE NEW YORK TIMES MAGAZINE

Explorers Club Elects President

The Explorers Club of New York has elected Dr. Edward C. Sweeney president. Dr. Sweeney, a Washington, D. C., lawyer, recently received the Defense Department's "Antarctic Service Medal" for his contribtions to United States. expeditions.

Dr. Sweeney is a former law professor at Northwestern University and now is a Presidential appointee to the Subversive Activities Control Board. He has succeeded Dr. Serge Korff as president of the Explorers Club.

As an aide to Admiral Richard E. Byrd in World War II, Dr. Sweeney made trips throughout the Pacific. He visited the South Pole, traveled in the Arctic with three expedtitions and served as special consultant and geographer to the United States Weather Bureau.

Fabian Bachrach

Dr. Edward C. Sweeney

Strength of Snow Increased By Cold, Scientist Reports

WASHINGTON (Science Service) — The colder snow is, the stronger it is and the more weight it can support, according to Russell A. Paige, who is studying snow as a possible construction material in polar regions.

Mr. Paige told members of the 46th annual meeting of the American Geophysical Union that snow could be made stronger for building purposes by processing it with a pulvimixer or Snow Miller. This promotes growth of new bonds of ice between grains and strengthens existing bonds.

The strength of snow constantly adjusts to and depends on temperature. At temperatures from minus 20 degrees to minus 25 degrees, snow can support about 80 pounds a square inch, but at temperatures of 25 to 30 degrees above zero, it can support only about 18 to 25 pounds a square inch.

Raw Fish and Caribou Ribs Served at Canadian Dinner

CAMBRIDGE BAY, Northwest Territories (Canadian Press)—An appetizer of raw, frozen trout, followed by a main course of caribou ribs and Eskimo ice cream may not be everybody's favorite dinner menu.

But at a recent dinner of the Northwest Territories' Residents' Association in Cambridge Bay, many of the 100 white and Eskimo diners had second and third helpings.

The purpose of the dinner was to raise money for a community hall and to introduce association members to some foods native to the area 1,000 miles northeast of Edmonton.

Residents in several northern communities helped gather food for the Arctic dinner. Hunters in Coppermine, several hundred miles distant, trapped two caribou, and the afternoon of the meal, two Arctic hares were shot.

Hospital Ship Being Built To Serve Labrador Coast

ST. JOHN'S, Nfld. (Canadian Press)—A 240-ton hospital ship to provide medical care for inhabitants of the desolate northern coast of Labrador will be built here for the International Grenfell Association.

Dr. Gordon Thomas, superintendent of the Grenfell Mission at St. Anthony, Nfld., told the annual meeting of the Newfoundland Grenfell Association recently that the contract has been awarded to E. F. Barnes Limited of St. John's.

George A. Llano

United States Antarctic Research Program in Biology

BioScience April 1965

The circumnavigation of the Southern Ocean by James Cook in 1772-75 presaged the era of south polar navigation. Foster, naturalist to the expedition, brought back the first emperor penguin and Cook's report spoke of the abundance of seals on the island he named South Georgia. However, the southern fur seal, *Arctocephalus*, was already the object of a wide hunt by English sealers and, in 1790, U.S. vessels from Connecticut joined the English in the Falklands and South Georgia. By 1819, the South Shetland rookeries were discovered, bringing together more ships than have ever been seen since in these waters. These seal hunting voyages resulted in many notable discoveries and led, inevitably, to the sighting of Antarctica in 1820. James Eights, a naturalist from New York State, accompanied one such U.S. expedition in 1829-31 and became the first American scientist to visit the antarctic regions. Fuller observation and reports on the plants of the region were given by J. D. Hooker, surgeon, who visited antarctic waters with the British Erebus and Terror Expedition of 1839-43. In the following 60 years, little of biological interest from that part of the world appeared in the scientific literature, notwithstanding that during this time the southern fur seal was hunted almost to extinction and whaling in the Southern Ocean came to the fore.

The era of national expeditions began toward the close of the 19th century. It excelled in voyages of exploration and, outstandingly, in the development of antarctic biological talent. The accomplishments of the biologists of the late 19th and early 20th centuries have been strikingly set forth in the expeditionary reports. These today form a sound and classical basis for extending man's inquiry into antarctic life phenomena.

Arctic and antarctic research have many problems in common. Consequently, theory, methodology, and even the conclusions resulting from polar researches are not too far apart. There are, however, distinct environmental differences between the north and south polar regions and, therefore, quite naturally a dissimilarity in their respective biotas, best appreciated in their contrasting geophysical settings.

It is well known that the geographical North Pole is centered in a deep basin with 13 million square kilometers of ocean and paleocrystic ice. The Arctic Ocean is almost enclosed by three land masses. Their juxtaposition has favored the intercontinental migration of plants and animals during geologic time, giving them ready passage far into the interior of the continents of the Northern Hemisphere. The subarctic zone is a terrestrial environment of tundra and taiga, supporting a substantial vegetation. In some localities trees grow beyond the Arctic Circle. The Eskimo is the most conspicuous element, and is traditionally associated with the polar bear, the musk ox, and the caribou.

The South Pole is situated on a land mass of continental dimensions, having an area approaching 14 million square kilometers. Antarctica extends out more or less symmetrically almost to the Antarctic Circle. It is completely isolated from all other Southern Hemisphere continents by 2000 kilometers of open, deep, and turbulent seas, except in the New World sector, where the 1000-kilometer-wide Drake Passage serves as an equally effective water barrier between the Antarctic Peninsula and Cape Horn of South America. The tree line stops at about 54°S latitude in the Southern Hemisphere. This marks the farthest advance of primitive man toward the south polar region.

The subantarctic zone is an oceanic environment. Within this zone lies a phantom coast of pack-ice with a uniquely evolved biota circumjacent to the Southern Ocean and an inconceivable richness of sea life. Herein, too, lies the Antarctic Convergence, between 50° and 60° South latitude, which is used to establish the northern limit of the antarctic region. Ninety-six percent of the continent is buried under an average of 1900 meters of ice of pleistocenic expanse and climatic conditions with which antarctic terrestrial organisms must contend. Small areas that remain clear of ice and snow are a rugged, austere, and inhospitable terrain. Low temperatures challenge life even during the season of full sunlight. In order to survive, organic life must tolerate winter temperatures to −70°C. Terrestrial vegetation is sparse and composed almost exclusively of cryptogams which occur largely along the periphery of the continent. The native fauna is dominated by arachnids and insects. There are no fresh-water or terrestrial vertebrates, although whales, seals, and birds visit the coasts annually during the austral summer. There are, also, no introduced plant or animal species on the continent, except for possible bacterial pollution around the stations. Antarctica, the seventh continent, is without evidence of previous human cultures and is still without permanent settlements. The first men to overwinter on the continent were members of the British Antarctic Expedition of 1899-1900.

The seas about Antarctica are driven by the prevailing westerly winds and intermixed from below by upwelling currents which saturate the upper photic zone with nutrients. In the upper 100 meters, phytoplankton blooms of latitudinal extent form exceedingly rich pastures for planktonic grazers, particularly the krill (*Euphausia superba*), which swarms in such incredible masses that its numbers color great stretches of the sea's surface a burgundy red. This great concentration of food attracts and sustains a relatively simple pyramid of life — a vast host of animals, including fish, squid, winged marine birds, as well as the penguins, seals, and whales. Antarctica's isolation, the proximity of abundant food, and freedom from land predators make its coasts particularly suitable for breeding and nesting of flightless birds and for hauling grounds for seals. However, the survival of these vertebrates is dependent wholly on their ability to feed at sea. They are the principal and important links in the food chains of life in the sea.

Antarctic biological research oppor-

tunities pose many unique situations. While the region has few species, these are notable for their occurrence in large numbers. The flora and fauna are superlatively adapted to the rigorous environmental factors of high insolation, strong winds, low temperatures, and generally arid terrestrial conditions. Since the antarctic biota is made up of fewer species, the interrelationships, distributions, seasonal movements, life, and trophic cycles are less difficult to study than in the more complex temperate or even arctic biotas. For example, the large rookeries of Adélie penguins are valuable for the study of the very fundamental principles of population dynamics: individual and group interrelationships. The fearlessness of antarctic animals in the presence of man and, in the case of the flightless penguins, restriction in movement on land makes the penguins as well as the seals excellent subjects for a wide series of sophisticated experiments.

Climatic conditions vary in Antarctica and inclement weather may pose severe restrictions at times in a particular region. However, these difficulties may be overcome by modern techniques. An important factor in the development of antarctic field research is experience, which explains why the second austral summer is often the more rewarding. There are no restrictions on working methods under antarctic field conditions; data may be collected through telemetric instrumentation by electronic recording, from fixed platforms on and in the ice for working through 6-foot thick sea ice or for observing marine life below the fast ice, and in depth through the means of self-contained underwater breathing apparatus (scuba).

The focus of biological activity in the Ross Sea sector is the station at McMurdo, where the United States Antarctic Research Program has established a modern biological laboratory to meet both normal and special requirements for year-around or seasonal biological and medical investigations.

McMurdo Station is the U.S. center for air and surface transportation for much of Antarctica and a natural staging point for field work deep into the continent. A more modest facility at Hallett Station, 350 miles north of McMurdo, is open only during the austral summer. Palmer Station, on Anvers Island, Antarctic Peninsula, also has adequate facilities for year-around laboratory research. In order to enlarge the effective

FIG. 1. David T. Mason, biologist from the University of California at Davis, prepares to measure the temperature of a fresh water pond at Cape Evans, Ross Island, Antarctica. Measurements are taken at various depths as part of an over-all study of basic energy sources and pathways in fresh water bodies. (*NSF Photo*)

FIG. 2. With a cold wind sweeping across the 15-foot thick ice of this antarctic lake, Dr. Gene Likens, left, and Dr. Robert Ragotzkie, the University of Wisconsin, prepare to pump tracer amounts of radioisotope (iodine^{131}) into the lake to obtain information on currents. The measurements revealed much faster currents than expected. During the study, the scientists found evidence indicating that the 80°F water on the bottom of the lake was being heated by the ground beneath it. (Dr. Likens is now on the faculty of Dartmouth College.) (*NSF Photo*)

working area of the station, a 125-foot wooden vessel, designed for special service in and around the ice, is planned. Such a vessel would make possible biological, geological, and other investigations in the coastal areas of the peninsula and in the off-lying islands. Beyond these land facilities, U.S. Navy icebreakers often offer additional means for marine collecting and observation of birds and mammals at sea or in pack-ice during the antarctic summer, and as landing stages for helicopters for surveys of the biota of nunataks and mountain ranges inland from otherwise inaccessible coasts. Icebreakers have also supported biological exploration in the Ross Sea and on the Balleny and Macquarie Islands.

The research vessel ELTANIN is a multipurpose mobile station for oceanographic research, both physical and biological (see p. 287). Its capabilities of cruising for long periods of time and its wide range of collecting equipment give the marine biologist unexcelled opportunities to study oceanic life from the surface to the uttermost depths.

"Laboratory Antarctica" offers unique opportunities for field research in biology, as well as some by-products whose worth should not be overlooked:

1) The availability of a dependable logistic system for quick transportation to and from Antarctica and for the reliable support of studies in the field.

2) The opportunity of working in original areas where the total environment has not been affected through human activities.

3) The opportunity for developing programs to include undergraduate and graduate majors under the supervision of senior scientists.

4) The opportunity for giving younger scientists field experience; to observe, assist, and share expeditionary-type research under rigorous conditions where responsibility and due respect for survival values bring out leadership quality.

5) The opportunity for carrying out long-term studies in an environment which is not changing rapidly with the use of modern, permanent facilities.

The International Geophysical Year (IGY) of 1957-58, while lacking formal programs in the life sciences, turned the attention of U.S. biologists toward antarctic research. One of the principal attractions was the means for getting to these normally inaccessible regions, since the IGY organization had worked out the logistics of support. In contrast to the world-wide coordination and planning achieved by physical studies, biological activities were the results of individual initiative and, with the exception of medical and dental research, were of an exploratory or survey nature. Their support came from the United States National Committee for the International Geophysical Year, from the Office of Naval Research, and from the U.S. Naval Support Force. Biologists in the field during the period of 1956-58 were, for some time, largely unaware of the work of their colleagues. The events, summarized by the U.S. National Academy of Sciences in 1960 in the first report to the Scientific Committee on Antarctic Research (SCAR), recorded a surprisingly wide range of biological and medical inquiries: M. Neushul used scuba techniques for collecting marine algae in the South Shetlands; J. M. Sieburth and P. R. Burkholder investigated phytoplankton phenomena in the Drake Passage and the antibiotic properties of marine organisms. Terrestrial cryptogams were collected in the McMurdo Sound region, at Cape Hallett, and in the Windmill Islands by G. A. Llano; T. Péwé, N. Rivard, and Llano reported on the mummified seals of the dry valleys. Carl Eklund, leader of Wilkes Station, made surveys of the seals seen in the pack-ice, banded birds, and carried out telemetric biological studies. Wintering personnel at Little America were used for acclimatization studies by F. Milan. N. Pace and W. Siri carried out similar investigations on traverse personnel ranging out from McMurdo Station during the 1957-58 austral summer.

Since the International Geophysical Year, the National Science Foundation has had the responsibility for coordinating and administering the U.S. research effort in Antarctica. Through its Office of Antarctic Programs, the Foundation receives proposals from scientists at universities or in private and government research agencies for the support of scientific work described under the collective title of the United States Antarctic Research Program (USARP). Proposals must be submitted no later than February 15 of the year that the researcher wishes to go into the field, and in accordance with the instructions given in the Foundation brochure NSF 63-27. Transportation into and in the field, the construction, maintenance, and operation of the antarctic stations, medical care, search and rescue services, and other logistic amenities of life are provided by the U.S. Naval Support Force, which is assigned responsibility of assisting the Foundation in support of the national program.

The National Academy of Sciences' Committee on Polar Research represents the U.S. scientific community and offers guidance on national objectives and provides international liaison. The Committee's Panel on Biological and Medical Science has issued a report on the status of antarctic biological research, recommended the establishment of first-class laboratories in the field, emphasized the potential for graduate research and field training, taken the initiative in delineating principles for conservation in Antarctica, and reviewed significant proposals for research. Through membership in SCAR, the Panel has repeatedly contributed substantial suggestions for biological research of international scope. It was active in organizing the First Symposium on Antarctic Biology (Paris, 1962), and continues to facilitate the United States' efforts internationally through SCAR's Working Group on Biology. With the inception of USARP, biological research has experienced growth in the breadth and variety of laboratory and field activities in Antarctica, on the subantarctic islands and in the Southern Ocean. The programs also reflect an increase in the number of university graduates in biology attracted to polar research.

Research in Antarctica may be undertaken during the austral summer from November through February or throughout the antarctic year. Research may be completed in one season or it may be carried through one or more summer or winter seasons. In most instances, the data or materials collected are worked up at the sponsoring institution. Short-term summer investigations since 1960 have included endogenous rhythms at the South Pole (University of California, Los Angeles), biology and limnology of fresh-water lakes (University of Kansas), comparative study of skuas and jaegers (University of California, Berkeley), salt excretion in the Adélie penguin (Duke University), primary productivity in fresh water lakes (University of California, Davis), bacteriological and lichenological investigations (Clark University, Ohio State

University), micrometazoa of fresh waters (Kaiser Foundation Research Institute).

The Bernice P. Bishop Museum has conducted ecological surveys of land arthropods in many areas along the coast, in interior ice-free mountains, and on subantarctic islands, and this work has continued every summer since 1959. Bishop Museum has co-designed equipment for trapping airborne organisms from ships and aircraft, for information on the effects of wind currents in their distribution. Ornithologists of Johns Hopkins University have coordinated an international bird-banding program which has thus far banded some 90,000 antarctic birds, many as chicks. New bird-band designs, utilizing metal and plastic, and the use of dyes have been developed by J. W. L. Sladen for this program. This program has also continued in the summer since 1959. Bird-banding data are filed with the U.S. Fish and Wildlife Service in Washington, D.C. Ecological and microclimatological study of land arthropods was conducted by the University of Tennessee at Hallett and McMurdo Stations during two austral summers and the winter of 1959. Similarly, microbiological studies were made at McMurdo Station by the University of Texas during the 1961 winter. Other researchers have carried out summer studies of under-ice plankton blooms (University of Sydney) with the use of scuba. In 1965, a sub-ice chamber was introduced for the use of USARP scientists for conducting observations and experiments below the floating sea ice.

Stanford University has maintained a continuous year-round research program at McMurdo Station since 1959. The program is under the direction of D. E. Wohlschlag, who has most successfully utilized graduate majors to carry on independent studies involving one winter season in the field. The studies are primarily on the marine fauna of McMurdo Sound; earlier graduate work is now appearing as theses and professional papers on a wide variety of research effort. The 1965 winter biological program at Palmer Station is an ecological study of land arthropods; this work is under the direction of the Bishop Museum, which has conducted numerous short-term summer studies from McMurdo Station.

Not all of the U.S. biological research in Antarctica originates at McMurdo Station. There are a number of unusual exceptions which reveal the value of international cooperation in giving scientists greater geographic scope to their research. The Australian National Antarctic Research Expedition collaborated with the University of Wisconsin (R. L. Penney) in conducting penguin studies and with the Virginia Institute of Marine Science (W. J. Hargis, Jr.) in collecting fish parasites at Wilkes Station; similar collaboration with the Soviet Antarctic Expedition has supported a study of soil arthropods by Ohio State University (M. Pryor) at Mirnyy, where this year the University of Texas (G. H. Meyer) is conducting a microbiological project. Another recent example of international cooperation is the assistance of the British Antarctic Survey in transporting and assisting a three-man team, representing Johns Hopkins University (W. J. L. Sladen) and the Bishop Museum (J. L. Gressitt) in an 18-month ornithological and entomological study on Bird Island, South Georgia.

Present U.S. field studies in the Drake Passage and Weddell Sea are being conducted in cooperation with the Argentine Navy. The Lamont Geological Observatory and Texas A & M completed phytoplankton studies in the Drake Passage and Weddell Sea, respectively, in February, 1965. In the Antarctic Peninsula a five-man team from Harvard University worked at the Argentine Station, Melchior Island, completing a survey of littoral marine algae with the aid of scuba.

The physiology, ecology, diving behavior, and under-ice navigation of the Weddell seal was investigated, cooperatively, by the New York Zoological Society (C. Ray), Woods Hole Oceanographic Institution (W. E. Schevill), and the University of Arizona (G. Kooyman). The Old Dominion College, Norfolk, Virginia (J. Zaneveld), used scuba for collecting marine algae along the shores of McMurdo Sound north to the Balleny Islands. Other summer programs completed at McMurdo Station include endoparasites of antarctic vertebrates by Roanoke College (H. L. Holloway, Jr.), the ecology of terrestrial algae by Ohio State University (D. D. Koob), bryological habitats by the New York Botanical Garden (W. C. Steere and S. Greene), biochemistry of egg protein by University of California, Davis (R. E. Feeney), and the collection of cephalopods for

FIG. 3. Dr. Donald E. Wohlschlag, right, and his assistant, Robert Laird, both of Stanford University, prepare a metabolism chamber for use in a fish house on McMurdo Sound. The chamber is placed in a hole in the 9-foot thick ice below the house. The work is part of a study of the physiology and metabolism of antarctic marine fauna. (*NSF Photo*)

dicyemid mesozoans by Florida State University (R. B. Short). Johns Hopkins University (R. L. Penney and J. T. Emlen) completed a second year's study on the orientation mechanism in Adélie penguins on the Ross Ice Shelf; the study of Adélie penguin population dynamics (W. J. L. Sladen) and skua (R. Wood) continued at Cape Crozier.

Biological investigations aboard the USNS ELTANIN may be of long or short duration. One of the principal programs is the study of the biota of the Southern Ocean, which has resulted in large collections of marine organisms. This particular program is under the direction of Jay M. Savage and J. L. Mohr of the University of Southern California. Other programs include phytoplankton and bacterial investigations by P. R. Burkholder (Lamont Geological Observatory), the Bishop Museum study of airborne organisms, and collection of cephalopods by G. Voss (University of Miami).

Australians End Exploration Of Odd Antarctic Ice Dome

CANBERRA, Australia — Eight Australians have returned to Wilkes Station in Antarctica after spending two months investigating an unusual ice dome about 100 miles southeast of the station. The ice dome is of particular interest to scientists because it is virtually a small scale model of the Antarctic continent, the Australian News and Information Bureau reports.

The dome resembles the large continental dome in shape, in the gradual flow of the ice and in the way in which snow accumulates on its surface. For these reasons glaciologists may better understand the behavior of the ice of Antarctica, which stretches over 5 million square miles.

The party crossed the dome several times as they measured the thickness of the ice, its rate of movement and the accumulation of snow by observing measuring stakes planted in the ice a year earlier.

Experimental Base Planned In Antarctica by Australia

MELBOURNE, Australis— Scientists have produced a new Antarctic station of experimental design, the Australian News and Information Bureau reports.

The new station will be erected near the present Wilkes base in the Australian Antarctic Territory and will take about four years to complete. The new station is being built because the present Wilkes base is gradually being buried under snow accumulation.

The new ideas incorporated in the station will be tested during the coming winter. The reults are expected to be of great interest to other countries who have research bases in the Antarctic.

Hot Globe's Cool Spot

Washington, May 20 (NEWS Bureau) — President Johnson hailed Antarctica today as one place on the globe free of tension and discord.

Johnson called the polar continent a model of "peaceful cooperation among the nations of the earth" after he heard a briefing on exploration conducted under a 12-nation treaty. Treaty signers include the Soviet Union.

Speaking in the White House Cabinet Room, the President stressed that the treaty is proving to be a "most valuable tool" for progress in international relations as well as in science.

New Antarctic Admiral

Feb. 8

Rear-Admiral F. E. Bakutis, the commander-designate of the United States Navy Antarctic support force, arrived in Christchurch by Boeing military transport from Hawaii early last evening.

Admiral Bakutis, tall, lean, and deeply suntanned, was accompanied by Mrs Bakutis. He said the purpose of his 12-day visit was purely to familiarise himself with the command he will assume in April.

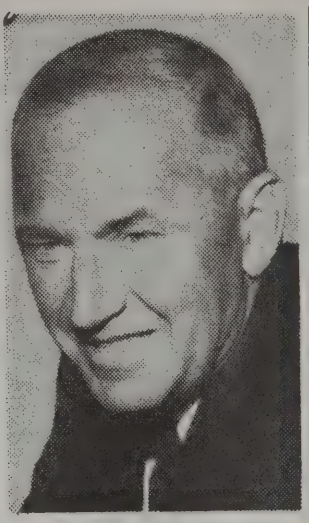
He said he was very happy to be visiting New Zealand and the Antarctic for the first time. He thought there would be no great change in the scope or size of the Antarctic task force. "Things will be pretty much as they are right now," he said.

Admiral Bakutis and his wife were greeted by the commander of the Navy support force (Rear-Admiral J. R. Reedy) and Mrs Reedy.

Today Admiral Bakutis will attend briefings at the American base at Christchurch Airport on the role of the Antarctic operation. He will also be issued with his Antarctic clothing. On Wednesday Admiral Bakutis and Admiral Reedy will fly to Wellington where calls will be made on the United States Ambassador, and New Zealand Government officials.

The two admirals will leave for McMurdo Station on Friday. Admiral Bakutis will return to Christchurch the following Tuesday, and on February 19 he and Mrs Bakutis will return to Hawaii.

He said the change of command from Admiral Reedy will take place in Washington, probably at the naval dockyard, in April.



U.S. Navy Photo

Rear Adm. Fred E. Bakutis, above, has relieved Rear Adm. J. R. Reedy as commander of the Naval Support Force Antarctica after a ceremony at the Washington Naval Yard. Reedy, who commanded "Operation Deep Freeze" since 1962, will be in charge of Carrier Division 7, part of the 7th Fleet.

During World War II Admiral Bakutis participated in air strikes in the Bonins, Yap, Palau, the Philippines, Formosa, and Okinawa. He was shot down by a Japanese destroyer and was adrift for seven days on a raft in the Sulu Sea. He was picked up by the submarine Hardhead, transferred to the U.S.S. Angler, and taken to Perth, Australia.

He is credited with 11 planes shot down, and much damage to shipping, grounded aircraft, and installations. He was awarded the Navy Cross, the Legion of Merit, the Distinguished Flying Cross with gold star in lieu of a second, the Bronze Star Medal and the Air Medal with six gold stars in lieu of additional awards.

Admiral Bakutis graduated from the United States Navy Academy at Annapolis, Maryland, in 1936. He was appointed to the rank of rear-admiral in July, 1961. In 1962 he was commander of the Alaskan Sea Frontier. This appointment would have little bearing on the Antarctic command, he said.

In March, 1964, he was ordered to duty as commander of the Anti-submarine Warfare Group I.

Antarctic Life Study Under Way

UNIVERSITY PARK, Pa. (AP) —A wildlife ecologist in the School of Forestry at Pennsylvania State University is making a survey of how the presence of man has influenced wildlife on the Antarctic continent, at the request of the National Science Foundation.

In particular, the ecologist, Dr. John L. George, will try to determine whether the Antarctic continent has been polluted inadvertently by radioactive or chemical contamination. For this study he will concentrate on bird and mammalian carnivores, or meat eaters, as the highest links in the ecological chain that begins with one-celled plants.

Samples representing as many carnivore species as possible will be collected, frozen, and returned to Penn State for detailed chemical analysis.

Antarctica: For Men Only

By Reuters

Wellington, N.Z.

The United States Navy admiral who will take command of "Operation Deep Freeze" in the Antarctic says he would not give up the tradition of keeping Antarctica womanless.

Rear Admiral Fred E. Bakutis took the antifeminist line at a press conference here when women reporters asked him if he intended to change the ruling against females in the American regions of Antarctica.

Rear Admiral James R. Reedy, the present "Deep Freeze" commander, said his wife is the leader of the "squaws," referring to a women's group whose aim is high heels on southern ice.

Radio Waves to Aid Study Of Antarctica's Ice Depth

WASHINGTON, Feb. 6 (UPI) —United States scientists have perfected a new radio technique to help them discover what the land surface of Antarctica is like under its miles-deep mantle of ice.

The new method, the National Science Foundation said yesterday, may eventually make it possible to chart the frozen continent's ground contours as rapidly as an airplane can fly over it.

It involves sending radio waves down through the ice and records the time it takes them to bounce back from the underlying ground. This provides a measure of ice depth.

The equipment was checked out at the South Pole where earlier seismic soundings had shown the ice to be 9,100 feet deep. The greatest known ice depth in Antarctica is more than three miles.

Sub-Ice Observation Chamber In McMurdo Sound

McMURDO STATION, ANTARCTICA — Three scientists of the New York Zoological Society, with the help of Navy personnel under Lt. (J. G.) Don Cornell, of Lloydell, Penn., Antarctic Support Activities Assistant Public Works Officer, have succeeded in submerging a sub-ice observation chamber in the frigid waters of McMurdo Sound.

The chamber, which was dropped through a hole in the six-foot thick ice shelf of McMurdo Sound, was developed by Alpine Geophysical Associates especially for the National Science Foundation. Consisting of a chamber large enough for two scientists, reached through a long tube that extends above the surface of the ice and anchored there, it gives the scientists an observation platform 15 to 20 feet below the surface.

The three men whose work involved the use of the chamber, Dr. Carlton Ray, Lt. David LaVallee, and Peter Gimble, have already gone beneath the surface of the Ross Ice Shelf with Scuba (self-contained underwater breathing apparatus) gear to conduct investigations of the sea life of Antarctica. Earlier this year, Rear Admiral James R. Reedy, Commander, U. S. Naval Support Force, Antarctica, had dived beneath the ice with the three men.

The chamber had been assembled and then field tested at Davisville, R. I., prior to being shipped to the Antarctic. But once there, modifications had to be made to it for ease of access and exit to the chamber itself. Shipfitters from the Public Works Steel Shop at McMurdo spent over two days on the modifications to the escape trunk of the device.

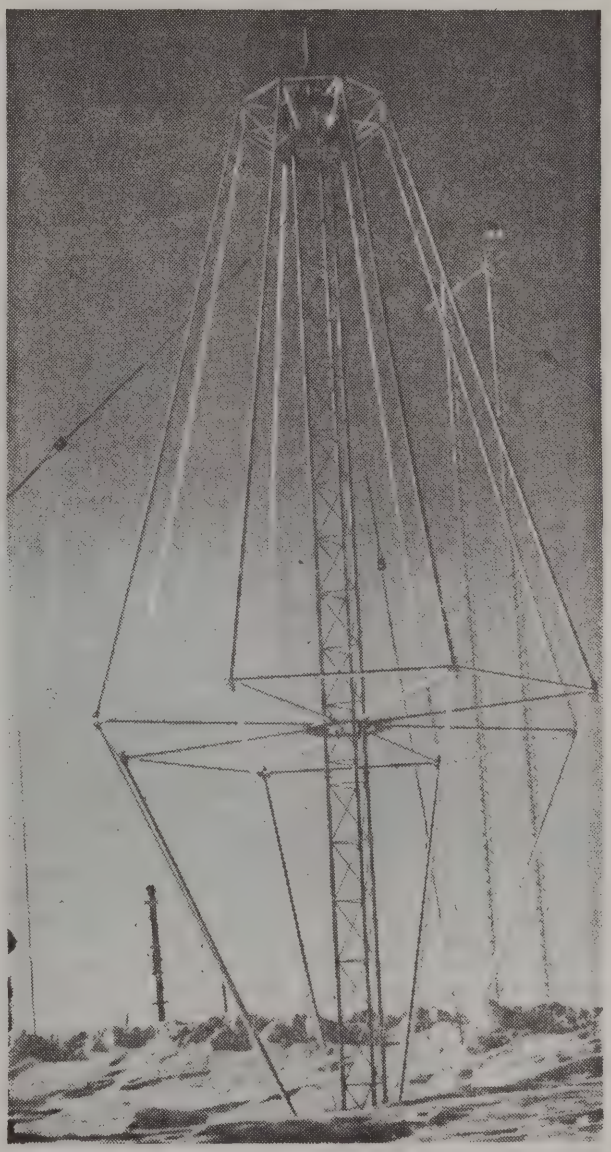
The Navy personnel, were under the supervision of LTJG Cornell and under the direction of scientists from the United States Antarctic Research Program (USARP), administered and funded by the National Science Foundation. They spent eight hours submerging the bell once it was finally brought out to the ice of McMurdo Sound.

Two D-4 Caterpillar tractors, one rigged with a large boom, and a ten-ton sled with an A-frame and skaggit winch were needed to do the work and were handled and manned by seven enlisted men of the Public Works Department. The two shipfitters were kept busy most of the eight-hour-long project with modifications to the chamber and hoisting equipment.

The men first lowered the bell portion of the underwater device into the Sound through a hole in the fast sea ice. Then the escape trunk was lowered and attached to the bell. Helping, or at least lending moral support, to men was a large Weddell seal who surfaced through the hole in the early hours of the job and then spent the rest of the time circling the bell once it had invaded the domain that had been his and his ancestors for thousands of years.

The scientists will be concerned primarily with the life of the Weddell seal and his unique bodily equipment that enables him to dive as deeply as 1500 feet in search of food without any apparent ill effects. The chamber will also be used by other biologists wishing to investigate the sea life of the Antarctic, which in sharp contrast to the land which supports almost no life, is the most abundant food and life producing area in the world.

Never before has man been able to go below the surface of the Antarctic Ocean. But man's skill and ingenuity and, above all, his courage and intelligence, are opening up new fields of study



WEIRD SHAPES of antennae used in various studies of atmospheric physics dominate the surface at Pole station. Research involves the aurora (southern lights) and low frequency radio waves.

Red Greeting Is Real Bust

Washington, Feb. 1 (AP)—A life-sized bust of Nikolai Lenin stands silent sentinel at the "pole of inaccessibility," the farthest inland point of antarctica.

American scientists found it recently during a 900-mile journey across an unexplored section of the Antarctic's "white desert" to an unoccupied Russian base.

Russian members of a scientific expedition had left a note for the American exploration party they knew would try to cross the unexplored section. It welcomed the Americans; told them where to find matches, cigarets, food and fuel in a small building, and reminded them to "please lock the door" when they left.

The bust of Lenin, the founder of the Soviet Union's Communist government, tops a 20-foot tower of the rest hut.

Dr. Richard L. Cameron, Ohio State University glaciologist, led the American expedition, which started from the U.S. research station at the South Pole.

U.S. Antarctic Expedition Finishes 1,200-Mile Stage

CHRISTCHURCH, New Zealand, Feb. 2 (Reuters)—The first 1,200-mile stage of a major American expedition in the Antarctic ended today, reports reaching the base here said.

A United States Navy ski-equipped Hercules aircraft picked up the nine-man party making the traverse of the high polar plateau not far from the pole of inaccessibility, the part of the continent farthest from the sea.

The Hercules flew the men to the Amundsen-Scott South Pole Station, from which they set out Dec. 5.

Vehicles were left behind on the plateau. They will have to be dug out and preheated when the expedition resumes next season.

The traverse is planned to end in four years at the Belgian Roi Baudoin Base on the Princess Ragnhild Coast.

Plane Crashes in Antarctic

AUCKLAND, New Zealand, Jan. 12 (AP)—A ski-equipped United States Navy DC-3 crashed while landing early today near Byrd Station in the Antarctic, the Christchurch headquarters of the Antarctic expedition announced. An operations officer said no one was hurt.

Scientist Experimenting With Penguins

McMURDO STATION, ANTARCITIA — Operation Deep Freeze Air Development Squadron Six (VX-6) pilots, air-crew and shop personnel have been busily occupied this season with the strange, bizarre and important experiments of a Johns Hopkins University scientist whose primary interest on the Antarctic continent concerns those amusing and bewildering creatures of the cold — penguins.

The scientist, Dr. Richard L. Penny, has designed a special radio broadcasting set to attach on the flippers of penguins that are taken from their normal nesting homes and released hundreds of miles away. Radio messages from each penguin are received at a central station enabling the scientist to track the travel pattern of each penguin.

The likeable hygiene and public health official says, "We are interested in determining if these penguins taken from their home areas will orient themselves and follow a homing pattern when they waddle off across the snows of Antarctica. Much can be learned about their ability to find their way home, and the secrets of their navigational ability.

In 1963, Dr. Penney performed an experiment with Adelie penguins, an Antarctic species weighing about 15 pounds. He found that the penguins consistently started in a direction with a definite relationship to their coastal homes. This study indicated that nature gives the non-flying, waddle-walking penguin an ability to find the sea and his rookery.

The penguin has a built-in biological mechanism, used together with the position of the sun, that allows him to navigate home again.

If the penguin is lost southeast or southwest of his shoreline rookery, he will walk due north instead of straight for home, and eventually reaches the sea.

Dr. Penney now wants to know how and why the penguin is able to find his way home when he finally reaches the shoreline of the sea. His first experiment with navigating penguins was in 1959 when he released five penguins at McMurdo Sound, 2,400 miles from their home. Three of them arrived in eight months. Since they do not travel at night, the three penguins had walked and swum about eight miles each day.

His present investigation began at the beginning of this new Deep Freeze summer support season. His team removed groups of penguins from several colonies, released them thousands of miles from home, and are currently following them by radio during their long treks.

Each penguin has a small radio transmitter slung in a harness under one flipper. From a VX-6 aircraft, investigators are following them by radio reception. They map their progress as the birds plod their way across the white continent.

VX-6, home-based at the Quonset Point, R. I., naval air station, is part of Task Force 43 and Operation Deep Freeze which supports the United States Antarctic Research Program (USARP) under the auspices of the National Science Foundation.

The squadron provides aerial support, supplies five scientific stations, conducts aerial photomapping, performs search and rescue duties and provides aerial reconnaissance and trail support for scientific field parties.

COLLECT PENGUINS—Dr. Richard L. Penny, of Johns Hopkins University, Baltimore, and a Russian scientist, collect Adelie penguins on Fuimar Island near the Soviet Mirny Station in Antarctica. The birds were used to experiment their ability to navigate long distances. **(Official U.S. Navy Photograph by Capt. John Alley USAR)**

Ice Breakup Perils Air Field

WASHINGTON, Feb. 23 (AP) —A severe ice breakup is threatening to send the air field at the Navy's McMurdo Station in Antarctica into the sea. Rear Adm. James R. Reedy, commander of Operation Deep Freeze, has reported to the Navy Department here that ice in McMurdo Sound was cracking dangerously.

21-Mile Antenna Built For South Pole Studies

WASHINGTON, March 9 (UPI)—United States engineers have stretched the world's longest antenna on top of the Antarctic icecap to study radio conditions in space beyond the earth.

The antenna is a 21-mile, plastic coated, three-quarter-inch copper cable twice as long as any ever built before, the National Science Foundation reported today.

Since the snow and ice are one and a half miles deep where the wire was laid out, 900 miles from the South Pole, the antenna is in effect a mile and a half high.

The antenna radiates very low frequency waves of the sort generated by lightning.

The foundation said whisters occur when a lightning stroke generates radio waves that travel far out into space along a line of force in the earth's magnetic field. The waves follow the line as it curves back to the globe in the opposition hemisphere.

SOUTH POLE AIR HELD HURRICANES' CAUSE

VANCOUVER, B. C. (Canadian Press)—A meteorologist said recently that the source of Atlantic Ocean hurricanes is cold air from the South Pole.

The theory of Comdr. M. R. Morgan, based on studies of hurricanes in 1962 and 1963, is that Antarctic air pushes its way into the warm air of the tropics at certain intervals. This creates a turbulence in the atmosphere—a hurricane.

At most times, the cold air cannot get through the weather system lying between the tropics and the South Pole, the theory maintains. But the South Pole air whirls at a definite rhythm, with periods of peak strength every 15 to 20 days, and occasionally breaks through at weak spots.

Commander Morgan said his observations show that hurricanes can be predicted.

When certain measurable factors coincide, he said, "the probability of a tropical storm developing in the eastern North Atlantic within five to 10 days is very high."

He presented his theory at a meeting of the Canadian branch of the Royal Meteorological Society here.

Antarctica a Huge U.S. Laboratory

By R. J. R. JOHNSON
Written for Associated Press

McMURDO STATION, Antarctica (AP) — In haunted Cape Evans, Scott's last hut stands in the drifts, still waiting for his return.

Skua gulls scream and dive at intruders and snow petrels whisper through the air like white butterflies.

Below the birds, a lone biologist chinks out the ice of a freshwater lake, measuring the signs of life. He wears the bright red parka of USARP; he is a scientist with the U.S. Antarctic Research Program.

The birds, the snow and the rocks have been Antarctica for centuries. The hut has stood for 50 years. The man in the red coat symbolizes Antarctica today.

It has become one of the biggest scientific laboratories in the world. Only the challenges of space can compare with it.

Antarctica is still the same vast, unforgiving place that challenged such early explorers as Capt. Robert Scott, who gave his life for it, and Roald Amundsen and Ernest Shackleton. But it now attracts a different breed of men. Much of the mystery is gone, the airplane has opened up the heart of the continent.

Today, American scientists are flown here by Air Force and Navy planes early in the summer. They work through the 24-hour long days of sunshine and are ready to return before the sun slips away.

Operation Deep Freeze as the Navy calls its Antarctic program, is now in its tenth year. What began as a support program for the International Geophysical Year of 1957-58 has become a continuing thing.

Byrd Station, built as an IGY base, has been declared unsafe and a new one built. You enter through a long, sloping tunnel. Inside, prefab buildings are strung out like railroad cars. The tunnels are cold and frosted. The snow is blue where it has been scraped.

Pilots, Seabees and scientists live in little rooms like Pullman compartments. But there are well-stocked libraries and a mess hall open around the clock for relaxation and socializing.

There is no scenery at Byrd Station. There is nothing topside but snow as far as you can see.

One young scientist who arrived at McMurdo this summer after 14 months at Byrd went around for days with a grin of ecstasy on his face.

"Mountains!" he would say "Mud!"

McMurdo has lots of both. It is built on Ross Island, a patch of solid volcanic ground between the Ross ice shelf and the sea. Mount Erebus, the only known active volcano in Antarctica, dominates the island with snowy grandeur. The great western mountains lie on the horizon.

The Ross Sea is opened by Navy and Coast Guard ice breakers to permit cargo ships to anchor in Scott's historic berth here.

Sailors and scientists at McMurdo usually live in Jamesway huts — The Ross Hilton, the Playboy Club. These are domed structures of plywood and canvas. Oil stoves make top bunks unbearably hot while often failing to melt the ice off boots on the floor.

Crazy as it may seem, most men who have been to Antarctica developed a tremendous desire to return and many are reluctant to leave.

"Those mountains are like a magnet to me," said a Minnesota naval officer who has seen plenty of the world.

Antarctica can be beautiful — the snow reflecting the piercing blue of the sky; the air crisp but dry, and the sun making lazy loops overhead as regular waking and sleeping schedules are forgotten.

It can also be vicious, whipping up tremendous, surging winds almost without warning and putting a halt to all man's activities. Without shelter, such storms can kill.

Then suddenly the storm breaks, the sun comes out again. Seabees get back to their never-ending jobs of road and base building, airplanes and helicopters are cranked up and the scientists can go about their business.

Sometimes, too, Antarctica simply closes in. Clouds so thoroughly blot out the sun that no shadows fall. Sky and snow become the same dead white. Here is no horizon; there is nothing but whiteness all about.

This is known as a whiteout, a deadly blurring of definition in which snowdrifts and crevasses vanish from sight and distances lose meaning.

As surely as in a blizzard, all activity must stop in the whiteout. And surely as a blizzard, the whiteout convinces men that Antarctica doesn't really give a damn.

The USARPs and pilots and most of the sailors are leaving Antarctica now. The busiest part of USARP-65 and Deep Freeze 65 is over.

Soon the long sunless winter will move in. The skuas will cease their mournful cry: "Go way! Go way!" They'll have Cape Evans, their home, to themselves for a time. Then they, too, will head north.

The men of the wintering parties will stay close to home. The night belongs to the mountains, and to the wind.

COOL PASTIME—Divers Jim Curtis, left, and Jack Fletcher of Old Dominion College, Norfolk, Va., display red starfish they brought up from 60 feet below ice in Ross Sea while diving for seaweed for biologists.

Army Polar Aviators Will "Think Warm"

FORT EUSTIS, Va. (ANF) The twelve officers and enlisted men who make up Fort Eustis' U.S. Army Aviation Department for Antarctica Operation DEEP FREEZE support have a unique and practical slogan — "Think Warm."

They will need that slogan for the next six months which will be spent in the South Polar region. The detachment is the first Army unit permanently established in the area, although temporary duty units and individuals have worked with the Navy in Antarctica continuously since 1956.

The Fort Eustis Detachment, commanded by Maj. William C. Hampton of Madison, Tenn., will use helicopters to map unexplored areas at four major sites during Antarctic summer.

It will support scientists from the U.S. Geological Survey, Texas Technological College, and Ohio State University.

CONEY AQUARIUM GETS 4 RARE SEALS

Young Animals Are Flown in From McMurdo Sound

By WILLIAM BORDERS
The New York Times

Feb. 16

Four rare young seals were flown in to the Coney Island Aquarium from Antarctica yesterday.

Paul Montreuil, the director, who caught the seals last week in McMurdo Sound, accompanied them on the 12,000-mile trip here. He believes they are the only ones of their kind now in captivity.

One male and one female are crabeater seals, a medium-weight, fawn-colored species of which only one or two have ever been caught before. Asked if they might reproduce at Coney Island, an Aquarium spokesman said, "They're certainly expected to."

The two others, both females, are Weddell seals, also a rare breed. The Weddells are larger and darker than the crabeaters; when fully grown they will weigh about 1,200 pounds, compared with a crabeater's adult weight of about 700 pounds. The Aquarium thinks one of the Weddells may be pregnant.

About half a dozen Weddells have been captured in the past, but all are believed to have died in captivity, including three that the Coney Island Aquarium brought back from McMurdo Sound in November, 1963.

One of the new seals is thought to be only a few months old. The three others are 2 to 4 years old, or "emerging from adolescence."

For the three days that it took a Navy plane to get them here, the seals were surrounded by ice and sprayed with cold water. Although the whole experience was too upsetting for them to eat anything on board, they are expected to get back this week to a near-normal diet of mackerel and herring.

The Aquarium's new tenants, which have not yet been named, are expected to be popular with the public. But they will also be the object of intensive biological study.

"These animals are so rare," an Aquarium spokesman said, "that almost anything we find out about them will be new."

The Weddells, for example, are known for the wide variety of their "speech" — whistles, buzzes, beeps and chirps that the Aquarium plans to record and analyze. The seals will also be studied for new knowledge in such fields as the physiology of diving.

Weddell seal and Dr. Carleton Ray, assistant aquarium director, have exchange of views

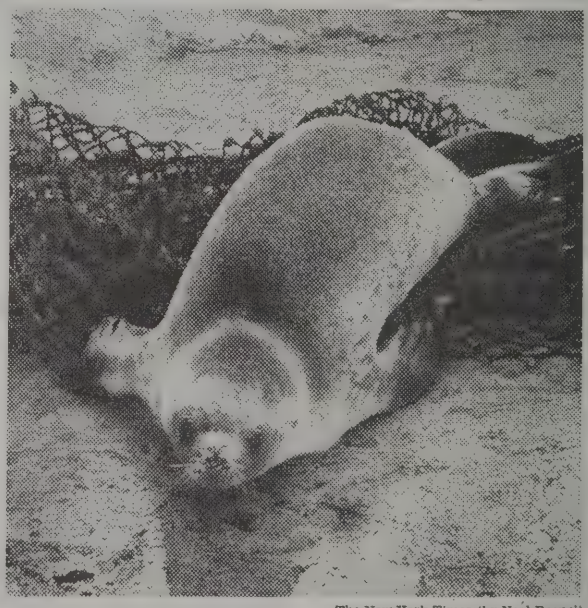
Heat Perils 58 Penguins

WASHINGTON, Feb. 21 (UPI)— A 10,000-mile flight from Antarctica last week nearly proved tragic fo ra cargo of penguins headed for U.S. zoos, it was learned yesterday.

The National Science Foundation said an air - conditioned Navy turboprop transport plane carrying 58 penguins Feb. 11 developed engine trouble at Nandi in the Fiji Islands and had to return to Christchurch, New Zealand.

"Four of the birds died from overheating," reported the foundation, which operates the U.S. Antarctic research program at McMurdo Sound.

The penguins finally went to zoological gardens at St. Louis, Mo., and Milwaukee, Wis., and to Johns Hopkins University in Baltimore.



The New York Times (by Neal Boenzi)

One of two crabeater seals flown here from McMurdo Sound

Scientist Is Reported Lost In Snowstorm in Antarctic

WASHINGTON, May 9 (UPI) —A young American scientist doing research in the Antarctic has apparently lost his way in a blowing snowstorm and wandered to his death, the National Science Foundation reported today.

He is Carl Robert Disch, 26 years old, of Monroe, Wis. A foundation spokesman said Mr. Disch was missing from Byrd Station in the Antarctic and "is presumed lost."

The temperature at the time of his disappearance was 45 degrees below zero, with blowing snow pushed by 35-mile-an-hour winds.

Mr. Disch was operating a small radio substation slightly more than a mile from the main station yesterday. He radioed at 5 P.M. Eastern daylight time that he was returning to the main station. A hand-line connects the two installations.

Search parties followed his tracks for four miles before snow obliterated them.

WHALING DECLINE CAUSING CONCERN

London Parley to Discuss Future of Industry

The New York Times

LONDON, June 27 — The International Whaling Commission will meet here tomorrow for critical discussions about the continued existance of the industry.

Informed observers predict that, unless Japan can be persuaded to reduce her share of future catches, two more species of large whales—the fin and the sei—may be reduced in three years to the present precarious status of the blue whale, the biggest animal in the world.

From a commercial point of view, blue whales are now almost nonexistent.

Operating without official restrictions on the catch last season, the combined fleets of Norway, the Soviet Union and Japan—about 250 ships—managed to catch only 11 blue whales. But they made up part of their self-imposed quotas by harpooning 7,000 fin whales and 20,000 sei whales.

Biologists of the United Nations Food and Agriculture Organization worked out how long the world's remaining whale stocks could withstand this degree of killing. They confronted the industry with their findings at a special meeting of the commission in London eight weeks ago.

Norway and the Soviet Union volunteered to reduce their catches to what fishery biologists call a sustainable yield.

Japan's delegates refused to reduce their quota proposal for the 1965-66 season below 4,500 blue whale units—a system in which one blue whale equals two fin whales or six sei whales. However, Japan agreed to reconsider limitations on future catches.

During the next four days the commissioners will reconsider world whale stocks in the light of the assessments prepared by F.A.O. biologists.

Antarctic Scientists Study Satellites' Radio Signals

WASHINGTON, April 7 (UPI) —Scientists in Antarctica are studying radio signals from passing satellites to help determine the exact shape of the earth.

The National Science Foundation, which finances Antarctic research, reported today that three engineers from New Mexico State University had set up and were manning a special satellite tracking unit at the United States McMurdo Station.

Meanwhile, Stanford University scientists have established a unit at the Byrd Station to receive information from the space agency's Polar Orbiting Geophysical Observatory when it is launched later this year.

A number of satellites are already in polar orbit. The New Mexico observers are tuned in on three spacecraft that pass near McMurdo 42 times a day

Pink Mite Discovered Near the South Pole

The New York Times

WASHINGTON, Feb. 2—A tiny, pink mite has been found living 309 miles from the South Pole, closer to the pole than animal life has been known to exist, the National Science Foundation said today.

The mite, a hundredth of an inch long, has no common name. Entomologists call it nanorchestes antarcticus.

It was found by a team of scientists near the mouth of the Robert Scott glacier. This is more than 100 miles closer to the pole than insects had been discovered before and several hundred miles closer than penguins and other birds.

Simple plants called lichens were discovered at another point 266 miles from the pole, closer than any kind of life had been found.

Both the mite and the lichens were found by Keith A. J. Wise, an entomologist from the Bishop Museum in Hawaii. Dr. J. Linsley Gressitt, director of the Bishop Museum project, has been surveying the insect and mite population of Antarctica for six years under National Science Foundation grants.

Argentine Antarctic Base

BUENOS AIRES, April 3 (Reuters) — The Argentine Army has set up a new scientific base in the Antarctic 590 miles from the South Pole. The base, called Sobral, is on the southern edge of the Filchner Ice Barrier. It will be manned by four men who will measure the movements of the ice barrier.

Russian Classes in Antarctic

CHRIST CHURCH, New Zealand, May 8 (Reuters)—American scientists and sailors at the McMurdo station in Antarctica are learning Russian from a Soviet scientist during the southern winter. The teacher is Igor Zotikov, a physicist and a member of the Soviet Academy of Sciences.

ANTARCTICA'S COLDEST

Coldest temperatures in Antarctica are in the interior on the high plateau, where it is more than 3,000 feet above the pole. The temperature has reached 125 degrees below zero there.

WHALING COMMISSION SETTLES ON A QUOTA

The New York Times

LONDON, May 6—The International Whaling Commission agreed today on a three-year plan for conservation of the world's whale stocks. It also set a lower quota on the catch for the next whaling season.

Representatives of 13 countries have been trying for four days to ascertain how many whales of various species can be caught year after year without danger to breeding stocks.

Japanese disapproval prevented agreement on an almost unanimous proposal that no more than 4,000 blue-whale units be caught in the Antarctic next year. A unit equals one blue whale or two fin whales or six sei whales.

The 13 national representatives of the commission eventually agreed to a quota of 4,500 units for the 1965-66 season.

Last year, after the commission failed to reach agreement at its meeting in Sandejeford, Norway, the only three nations engaged in deep-sea whaling—Norway, the Soviet Union and Japan—agreed to a quota of their own.

It was for 8,000 blue-whale units, twice the figure recommended on the basis of detailed surveys by fishery biologists of the Food and Agriculture Organization of the United Nations. But only 7,000 units were caught despite intensive competitive fishing.

Virtually uncontrolled whaling during the last season—December to April — has reduced stocks of the sei (pronounced "sigh") whale by an estimated 20,000.

The kill of 20,000 was four times bigger than the 1960-61 season. The combined fleets also harpooned about 7,000 fin whales as against 27,000 five years ago. The estimated total stock of fin whales last fall was estimated to be 36,000 and the sustainable yield would be about 4,000 although even this figure would not allow the stock to increase.

Total sei whale stocks are "probably" down to about 47,000, which means that the present killing rate will soon reduce them to "negligible proportions."

Women Going to Antarctic

AUCKLAND, New Zealand, June 23 (AP)—The United States will build a barracks for six women scientists at McMurdo Station, Comdr. W. H. Withrow of the Navy Antarctic base has reported. He told the Canterbury branch of the New Zealand Antarctic Society he had no idea when the women would arrive and he did not identify them.

Icebreaker Moves Floe

BOSTON, Feb. 10 (AP)—Coast Guard headquarters reported Wednesday that the icebreaker Eastwind, on duty in Antartica, had pushed a 24-mile square ice floe 10 miles into open water when it threatened to close the channel to McMurdo Station. The floe was six miles long and 4 miles wide. Pushing it took two days. The Coast Guard estimated the floe weighed between 80 and 90 million tons.

Icebreaker Returns to U.S.

BOSTON, April 12 (AP)—The Boston-based United States Navy icebreaker Glacier arrived home today after six months in Antarctica. The trip completed a decade of service to Operation Deep Freeze, entailing travel of 30,000 miles.

ESKIMO HALL OPEN IN NEW SPLENDOR

Section of Natural History Museum Is Renovated

The New York Times

March 5

The Eskimo life portrayed at the American Museum of Natural History is a true vignette of about a half century ago, but many aspects are still as true of today, including the igloo.

It has been two years since the popular Eskimo figures in full fur regalia and the ingenious objects devised by the Arctic and sub-Arctic people have been on view. Now, enlarged, spick and span and dressed up with wall murals and painted maps, the Hall of the Eskimo is again open to its large following.

One of the objects of greatest fascination, the igloo, is sure to attract, as in the past, clusters of visitors marveling at the exotic housing, shown in cross section with furnishings.

Life-size Eskimos have faces modeled from life masks, according to Dr. Stanley Freed, the assistant curator of ethnology. Dr. Freed has been in charge of developing the new hall.

A great wall map of Eskimo-inhabited areas, which was receiving its finishing touches yesterday, shows the Bering Strait route that was probably followed by the Asiatic ancestors who migrated to this hemisphere.

Modern whaling is a mechanized enterprise, but in Eskimo waters, as a 20-foot panel shows, the dramatic chase is conducted in a canoe and the weapon is a skillfully home-crafted harpoon. Handsome ornaments, carved of walrus tusk and used at times to embellish skin-covered kayaks, hunting implements of whalebone and many ornaments and utilitarian articles of driftwood show the ingenious makeshifts of a people with few resources of nature.

New Zealand busy in Antarctic

Ultramodern Vessel For Antarctic Study Launched in Japan

The New York Times

TOKYO, March 20 — Japan launched an ultramodern 300-foot floating laboratory this week for use in Antarctic explorations.

The vessel is also said to be one of the world's most powerful icebreakers.

It is designed to ram through ice packs up to 20 feet thick.

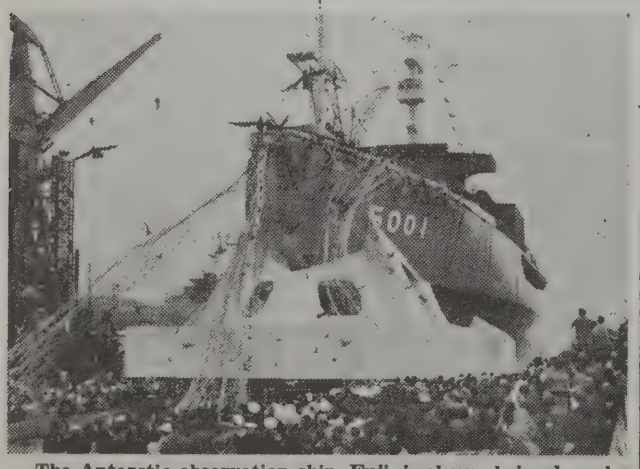
Crown Princess Michiko cut the launching line with a silver ax on Thursday to send the 7,760-ton exploration ship, the Fuji, down the ways at the Nippon Kokan Shipyard in Yokohama.

The vessel's special construction of high-tension steel is said to give it a structural strength of 20 to 30 per cent greater than that of ordinary ships. Its Mitsubishi diesel electric engine gives it a top speed of 16.5 knots, with a cruising range of 15,000 miles.

Special features include a bowl-shape hull construction to lessen danger of crushing in heavy ice, and stabilizing tanks to counteract rolling in stormy seas.

Ice pressing on the rounded sides of the ship will cause the vessel to slide upward, the designers say. When the vessel begins to roll, water will rush to tanks on the opposite side to hold the keel even.

A flight deck is designed to accommodate three helicopters to assist in Antarctic exploration. Quarters are provided for 40 scientists in addition to a crew of 198.



The Antarctic observation ship, Fuji, is shown being launched at the Nihon Kokan K.K.'s shipbuilding yard in Yokohama

By Albert E. Norman
Staff correspondent of
The Christian Science Monitor

Scott Base, Antarctica

For more than a century New Zealand has featured in the conquest of the Antarctic.

In 1841 it was a haven for the British Antarctic explorer Capt. James Clark Ross. Today in Antarctica his discoveries perpetuate his name.

The huge Ross Ice Shelf and Ross Sea are named for him. And the large section of Antarctica now formally claimed by New Zealand is called the Ross Dependency. This still provides the principal highway into the Antarctic, the road Ross found.

But for years nothing was done to justify New Zealand's claim to the dependency. In the 1940's some interest was shown in this desolate polar region. But not until the International Geophysical Year 1957-58 did New Zealand establish an active and continuous research program in its polar territory.

New Zealand was active from the start in the IGY program. As part of its contribution, it set up Scott Base here on Ross Island at the entrance to the Antarctic.

Before the huts were erected the New Zealanders opened a modest post office. To sustain a national claim to a territory, occupation and administration are necessary. So a post office, albeit a small one, takes on special meaning.

Recently, I transacted some business at this southernmost unit of the New Zealand postal service.

"Business hasn't been too brisk lately," the postmaster observed.

The post office may have legal significance in New Zealand's claim to the Ross Dependency. But it should be noted that New Zealand was a willing and enthusiastic signatory to the 1959 Antarctic Treaty. This document links all Antarctic claimant nations in a 30-year waiver of arguments concerning Antarctic territorial claims.

Although one of the smallest nations in the Antarctic community, New Zealand has one of the most active research programs. Most fields of research are included.

New Zealand scientists push these programs with vigor. Practically all the Ross Dependency has now been mapped. Most of this vast region was covered the hard way with men mushing with dog teams through all kinds of polar weather.

New Zealand soil scientists worked this season at the Antarctic end of a massive soils profile. This extends through along a line of Pacific islands to near the equator and south along the appropriate meridian to the Antarctic. The profile covers practically the southern hemisphere. No other nation has attempted soils research on this scale south of the equator.

Huge Iceberg in Antarctic

CANBERRA, Australia (AP) —An iceberg 90 miles long and 30 miles wide is adrift in the Antarctic Ocean, the Australian research ship Nella Dan reports. It said the iceberg, off Kemp Coast, Antarctica, is blocking the approaches to Edward VIII Gulf.

Scientists Drill For Cosmic Dust In Polar Icecaps

WASHINGTON (ANF) — The Army's Cold Regions Research and Engineering Laboratories with support of the National Science Foundation hopes to solve several cosmic mysteries within the next two years.

The illusive cosmic dust will be tracked by drilling 8,000 feet into a south polar icecap.

Arrangements call for the exploration at Byrd Station, Antarctica as soon as tests currently under way at Camp Century, Greenland, are completed.

A depth of 1,800 feet has already been reached in the Greenland tests by use of the thermal drilling process.

According to scientists, the explorations have a twofold significance.

First, the ice in both polar regions has captured and preserved cosmic dust which may be able to supply a record of what has fallen from outer space over a period of as long as 100,000 years ago. Studying the composition of the particles could be valuable to man's plans for space exploration.

Second, the base of the ice will reveal clues to the future flow of the ice. Scientists believe that a warming may have set in from the earth's core, which would result in a faster flow of ice and a slow raising of sea levels.

Perfected by the Engineering Laboratories, the thermal-type drilling penetrates only ice. When rock is hit, a cable is used to lower an electro-mechanical drill which deepens the penetration. According to scientists, the 8,000-foot hole at Byrd Station can be drilled in a year's time.

ANTARCTIC ACTIVITIES
1964 - 1965

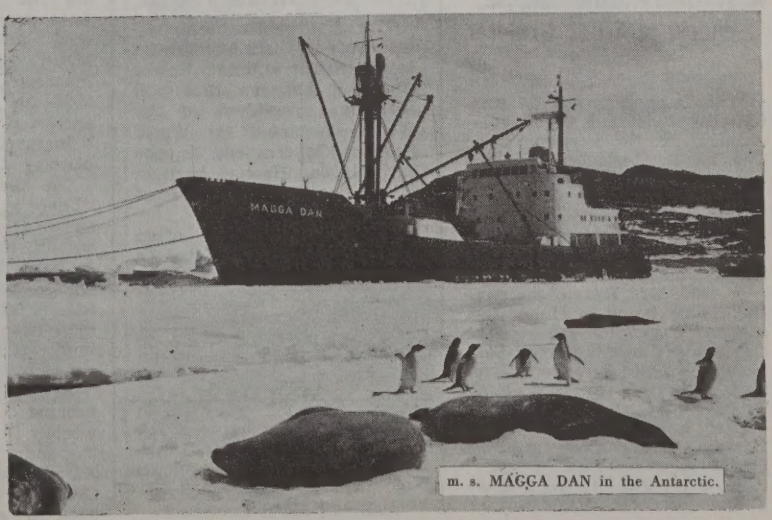
The NELLA DAN carried relief personnel and supplies to the Australian Mawson station and evacuated the Davis station. Using the NELLA DAN as base the Australian expedition also carried out various surveys in Enderby Land by means of helicopters and a ski-mounted plane.

The French relief expedition and supplies were carried by the THALA DAN to the Dumont d'Urville station on the Adelie Coast, and the THALA DAN was furthermore used by the Australian expedition to supply the Wilkes station and evacuate the Davis station.

The MAGGA DAN took the combined Belgian/Dutch relief expedition and wintering supplies to the Roi Baudoin base in Breid Bay on Princess Ragnhild Coast. On the voyage the expedition carried out various scientific work.

The KISTA DAN relieved the British station of Halley Bay in the Weddell Sea, calling en route at the Falkland Islands, South Orkney Islands, and South Georgia.

J. Lauritzen



m. s. MAGGA DAN in the Antarctic.

MAJ. VERNON BOYD, POLAR EXPLORER

Retired Marine Dead at 57 —Skills Praised by Byrd

The New York Times

OAKLAND, Calif., June 1—Maj. Vernon D. Boyd, U.S.M.C. retired, veteran of four Antarctic and 14 Arctic expeditions, died Saturday of cancer in the United States Naval Hospital here. He was 57 years old.

The blue-eyed, blond explorer, who served with the Marines in World War II and for two tours of duty during the Korean conflict, went on his first polar expedition in 1928. It was the Richard E. Byrd Antarctic expedition.

A cheerful, earthy man, he was usually in charge of transportation and mechanics. In "Discovery: The Story of the Second Byrd Antarctic Expedition," the machine shop and Major Boyd were praised by the author:

"Without the ingenious modifications and adaptations which Boyd turned out, the tractor, aviation and scientific departments might have had a much harder time of it."

In 1960 and 1962 Major Boyd was in the Arctic with the Arctic Institute of North America, described as a leading force in the search for knowledge in the North. Canadians and Americans staff the project.

Major Boyd is survived by his widow, Mrs. Nina Boyd of Steamboat, Nev.; a son, Frank of St. Louis, by a previous marriage that ended in divorce; his mother, Mrs. Ona Gardner of West Lebanon, N. H., and a sister, Mrs. John M. Shields of Leavenworth, Kan.

Mrs. Knud Rasmussen, 82, Widow of Arctic Explorer

April 23

Mrs. Dagmar Anderson Rasmussen, widow of Knud Rasmussen, Arctic explorer, died Tuesday in Copenhagen at the age of 82.

Mrs. Rasmussen preserved her husband's papers and collections, which eventually went to the Danish National Museum. Dr. Rasmussen died in 1933.

In 1935, Mrs. Rasmussen gave the family home in Hundested, a Copenhagen suburb, to the Government as a museum. Last year, she took part in a ceremony, presided over by King Frederick IX, at which a statue of her husband was unveiled. It stands a few miles from the capital and overlooks the sea.

Surviving Mrs. Rasmussen are a son, Nils C. Rasmussen of New York; two daughters, Mrs. Hanne Rasmussen and Mrs. Inge Thorborg of Copenhagen; five grandchildren, and six great-grandchildren.

Hjalmar Riiser-Larsen Is Dead; Aviator and Explorer in Norway

Led One of Two Seaplanes in 1925 Polar Expedition— Was Head of Airline

Dispatch of The Times, London

OSLO, Norway, June 4—Maj. Gen. Hjalmar Riiser-Larsen, an early aviator and a noted explorer, died yesterday in Copenhagen. He would have been 75 years old next week.

Commissioned as a naval officer in 1912, General Riiser-Larsen was among the first pilots to be trained in the newly created Norwegian naval air arm in 1915.

In 1925 he made his first polar exploration, leading one of the two seaplanes in which Roald Amundsen and Lincoln Ellsworth tried to reach the North Pole. The expedition had to make a forced landing near the pole and General Riiser-Larsen piloted the aircraft that eventualy brought all the members of the expedition back to Spitsbergen.

In 1928 he led the unsuccessful expedition that searched for Amundsen, who had disappeared in a balloon over the Arctic Ocean.

When the Norwegian airline was formed in 1933, General Riiser-Larsen was named president of the company. He held that post until the outbreak of World War II when he was appointed as Naval attache to Washington. Early in the war he was named commander of the Norwegian Air Force operating from Britain after the Nazi occupation of Norway.

He returned to civil aviation after the war and in 1947 was attached to the head office of the Scandinavian Airlines System to plan the new routes to South Africa and the Far East.

New York Herald Tribune

The Norwegian flier, who took part in three expeditions to the Arctic and two to the Antarctic between 1925 and 1933, was president of the World Movement for World Federal Government in the early 1950s. He had been in failing health for a number of years before his death.

Gen. Riiser-Larsen often went to sea, as a child, with his father, a merchant marine captain. He was graduated from the Norwegian Naval Academy in 1915, when he chose to make his career in the Naval Air Force.

1951

Hjalmar Riiser-Larsen

Gen. Riiser-Larsen became a close associate of the famed Arctic explorer Roald Amundsen, the first man to reach the South Pole. In 1926 he was skipper of the flying boat "Norge N-1" in the Amundsen-Ellsworth-Nobile expedition that flew from Spitzbergen to Alaska.

The year previously, he had served as commodore of one of the two Dornier Wall flying boats that had to land on the ice near the North Pole. The expedition reached a northern latitude of 87 degrees, 44 minutes. It was Gen. Riiser-Larsen who made the amazing takeoff on the ice that was the expedition's last chance to save itself.

In 1929 Gen. Riiser-Larsen led his own expedition to Antarctica, where he discovered and charted Queen Maud's Land and Crown Princess Martha's Land. In 1931 he was back in Antarctica, where he claimed Princess Ragnhild's Land for Norway.

On one occasion he said: "There is nothing that makes such an impression on a person as discovering land, to know that one is on land which no person has seen before. Think what results it may have for the discovered land and for one's own country!"

In 1933 Gen. Riiser-Larsen became a director of Norwegian Airlines, serving at the same time on the Naval Air Force staff. After the Germans invaded Norway in 1940 he escaped and served for a time as a naval attache in Washington, with his government in exile.

In Britain and in Canada, Gen. Riiser-Larsen, who was made an Air Force major general while still a Navy admiral, played a decisive part in building his country's Air Force in exile. He set up the "Little Norway" Air Force training camp near Toronto.

After the war, Gen. Riiser-Larsen became a civilian and represented his country in the negotiations that merged the air lines systems of Norway, Denmark and Sweden into the present Scandinavian Airlines System. For several years he served as SAS director for Norway.

DR. JAMES MARR, 62, A POLAR EXPLORER

LONDON, Friday, April 30 (AP)—The death of Dr. James Marr, polar explorer and biologist, was announced today. He was 62 years old.

He is survived by his widow and five children.

James William Slesser Marr had been principal scientific officer of the National Institute of Oceanography of Great Britain since 1949.

He was born in Aberdeenshire, Scotland, and educated at the Aberdeen Grammar School and University. In 1921, as an 18-year-old Boy Scout, he went with the Shackleton-Rowett Antarctic expedition in the exploration vessel Quest. The late Sir Ernest Shackleton headed the expedition.

In 1925 Dr. Marr served as zoologist to a British Arctic expedition. He was afterward appointed zoologist to the Colonial Service and took part in three subsequent British Antarctic expeditins.

In World War II Dr. Marr carried out research in the Antarctic into the canning, drying and freezing of whale meat for human consumption. He also served as a naval officer in Iceland and the surrounding waters, and later off the coasts of Africa.

He held many medals and awards, including the Scouts' Silver Cross and the Bronze Medal of the Royal Humane Society.

Arctic Ice 9 to 12 Feet Thick

Although the ice covering the Arctic Ocean can be nine to twelve feet thick, it amounts to no more than a thin layer of dust on a bucket of water. The ocean, reaching depths of 12,000 feet, unleashes gigantic forces that crush and grind the surface ice into fantastic ridges and formations, the National Geographic says.

PROF. FORBES, 82, OF HARVARD DIES

Physiologist and Geographer Charted Labrador in '31

MILTON, Mass., March 29 (AP)—Dr. Alexander Forbes, a physiologist and geographer, died Saturday at the age of 82.

Dr. Forbes, a former professor at Harvard who also taught at the University of Liverpool, led an expedition to Labrador in 1931. His findings were used my the United States Government to chart an air route across the North Atlantic during World War II.

Dr. Forbes was a grandson of Ralph Waldo Emerson. He is survived by his widow, three daughters and a son.

Mapped Mountain Chain

Dr. Forbes undertook the 1931 expedition with the 100-foot auxiliary schooner Ramah and two seaplanes. By means of aerial photography he mapped the Torngat Mountain chain. The schooner charted fjords from Indian Harbor to the northern tip of Labrador. The expedition also did botanical and geological research.

During World War II he was on active duty with the U. S. Navy as an aerial explorer and surveyor of areas between Labrador and Nova Scotia.

Even during his last years, he flew his own plane and skippered his schooner, the Stormsvala.

His war service climaxed a lengthy career in the North Atlantic, which started with a cruise to Labrador in 1931 to chart its coastline.

He was hailed upon his return as the "Julius Caesar of the Far North."

Four years later, he returned to the North, flying his own Fairchild cabin plane for an aerial survey. Among other organizations which came forward to honor him was the American Geographical Society.

ALBERT CHURCH, 85, WROTE ON WHALING

NEW BEDFORD, Mass., Feb. 8 (AP)—Albert Cook Church, a marine photographer, author and authority on whaling, died today in St. Luke's Hospital at the age of 85.

Mr. Church was the author of two picture books of the sea, "American Fishermen" and "Whale Ships and Whaling," published in 1938 and reissued in 1961.

"American Fishermen" contained many pictures of Gloucester schooners, old fisheries and some modern power fishing boats.

"Whale Ships and Whaling" contained some 200 of 65,000 photographs taken by Mr. Church before commercial whaling out of New Bedford was discontinued in 1925.

Mr. Church, who came of whaling forebears, early in life started to amass a camera record of every phase of whaling.

In addition to photographs, "Whale Ships and Whaling" traced the course of the industry from the days of the early settlers, who cut up whales they found stranded on the beach off Nantucket, to the voyage of the Wanderer, the last whaling ship to sail from New Bedford. The Wanderer was beached on Cuttyhunk Island off Massachusetts in 1924.

Last Survivor of Peary's 1893-94 Expedition Dies

PRINCE ALBERT, Sask., May 28 (CP)—George Carr, 97, of Prince Albert, the last surviving member of the Robert E. Peary Arctic expedition of 1983-94, was buried Thursday.

Mr. Carr, a native of Moulmain, Burma, died Monday. He is survived by a son, Ernest of Vancouver, B. C., and two daughters, Mrs. F. H. Underhill of Ottawa and Joyce Woodthorpe of Vancouver.

In 1954 an island in the Churchill chain of lakes in northern Saskatchewan was named in his honor by the provincial government.

On this HMNZS "Endeavour" cover are the autographs of Sir Raymond Priestley and Lt.-Col. Sir Philip Brocklehurst, the last living members of the Shackleton Expedition of 1907-09. Sir Raymond Priestley also accompanied the Scott Expedition of 1911-13.

GRENFELL

Sir Wilfred Grenfell, whose life work as a medical missionary to Labrador and Newfoundland was world-famous, will be commemorated on a Canadian stamp June 9, the centenary of his birth. The 5c green stamp, designed and produced by the Canadian Bank Note Company, shows Sir Wilfred standing at the helm of a ship, an icy peak in the background.

Sir Wilfred was born in Parkgate, England. He was educated at Oxford and London Hospital and served for three years aboard a hospital ship of the Mission of Deep Sea Fishermen, tending the needs of the fishing fleets around Labrador and Newfoundland. In 1892, he took up his mission post there to serve the inhabitants, as well as the fishermen and sailors. Later Sir Wilfred founded the King George V Seamen's Institute at St. John's. He died in 1940.

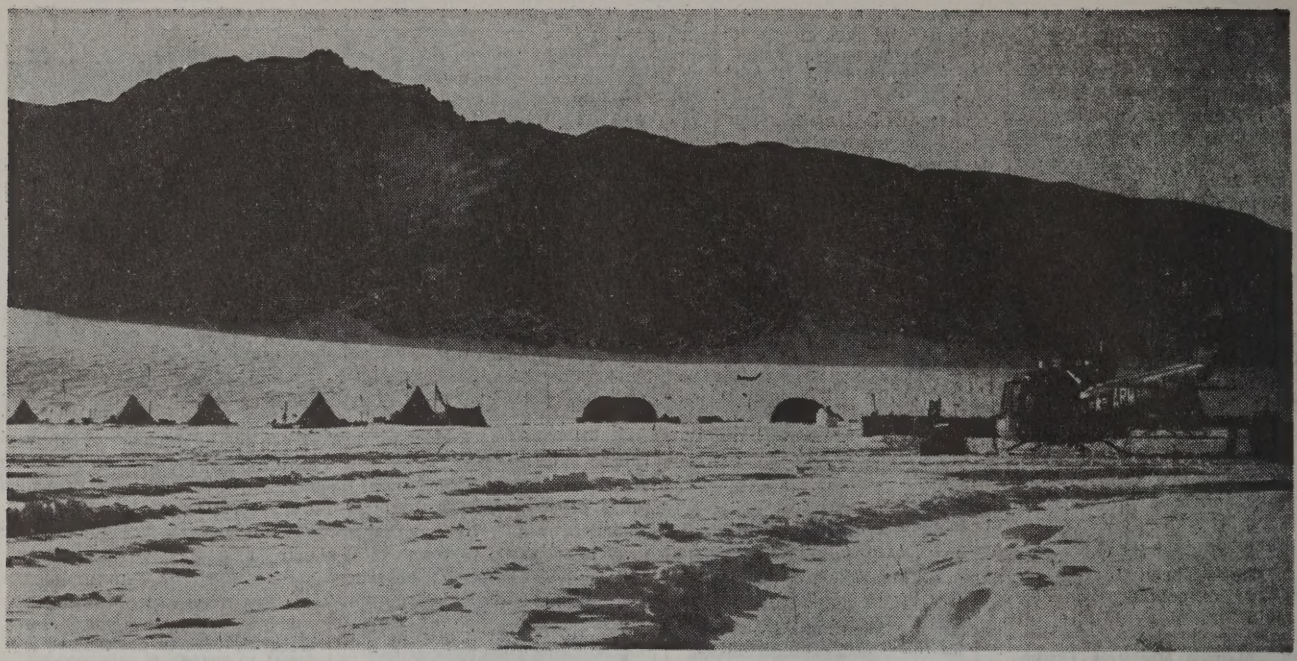
ANTARCTICA

Argentina has released two stamps of a three-stamp series devoted to her Antarctic bases and South Atlantic islands. A 4-peso blue depicts the ice-breaker General San Martin against a background of the mountain range of Tierra del Fuego. An 11p vermilion airpost shows the Teniente Matienzo base established in 1960 in the Antarctic.

A third stamp, 2p, which is forthcoming, will show the General Belgrano Base, Argentina's southernmost Antarctic base estalished in 1955, on the Lassiter ice shelf on the Weddell Sea.

ARGENTINA. Two postage and one airmail values (#757-58, C91) commem 60th anniv of Argentina's claim to Antarctic Territories.

FRENCH ANTARCTIC TERRITORIES. "Discovery of the Territory"



Scientists from Texas Technological college camp in a beautiful ampitheater on Shackleton glacier.

Winds are 50 mph, temperature 0 as Ohio State U scientists fight way through blizzard in Horlick mountains.

Photos by Robert J. R. Johnson from the *St. Paul Dispatch* and *Pioneer Press*.

← LEFT

Services end at Chapel of Snows, McMurdo station, a frontier town of about 1,000 in the summer. Streets are volcanic mud.

RIGHT →

Ice cakes piled up in front of the navy icebreaker Glacier in McMurdo harbor.